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UNDERSTANDING THE SCORES

HEARING-IMPAIRED STUDENTS

and the

STANFORD ACHIEVEMENT TEST

(7th Edition)

Thomas E. Allen

Gallaudet Research Institute
Center for Assessment and Demographic Studies

1986

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ABSTRACT

This manual summarizes technical information regarding the 1982 Stanford Achievement Test, Seventh Edition when administered to hearing-impaired students. In Section 1, the procedures used to select the norming sample (7,557 hearing-impaired students) are described, and the demographic characteristics of the resulting sample are compared to those of the Annual Survey. In Section 2, evidence for the reliability and validity of the test for the hearing-impaired student population is presented, including a discussion of the standard error of measurement and its implications in determining the significance of gains noted in scores from year to year. Section 3 contains a set of norm tables for selected subgroups of the sample, including: regions of the United States (Northeast, Midwest, South, and West); types of educational programs (residential schools, day schools, local schools with hearing students); three levels of hearing loss; students with and without additional impairments; and ethnic groups (White, Black, and Hispanic). (CB)

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READING COMPREHENSION

Mathematics Computation

RELIABILITY

SPECIAL NORMS

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PREFACE

The purpose of this manual is to summarize technical information about the 1982 Stanford Achievement Test, 7th Edition (Madden, Gardner, Rudman, Karlsen, & Merwin, 1982) when administered to hearing-impaired students. The Stanford (Form E) was normed with a national sample of hearing-impaired students in the spring of 1983 by the Gallaudet Research Institute's Center for Assessment and Demographic Studies (CADS). Funding for the project was provided by the U.S. Office of Education, Special Education Programs (Grant Number G008300004) and by the Gallaudet Research Institute.

In the norming, Form E of the Stanford was administered to 8,331 hearing-impaired students, of whom 7,557 provided valid age information on their answer sheets and were therefore included in the computation of the norms. These students were selected from the data base developed by CADS through its Annual Survey of Hearing-Impaired Children and Youth, a data base containing demographic and educational information on more than 50,000 hearing-impaired students. Since the norming, age-based percentile ranks have been published, and they have become part of a computerized score reporting system developed and now offered as a service by CADS. Several articles have been published that use data from the norming. The current manual is intended to provide technical support for these various uses of the Stanford test score data.

The manual is divided into three sections. In Section 1, the procedures used to select the norming sample are described, and the demographic characteristics of the resulting sample are compared to those of the Annual Survey. In Section 2, evidence for the reliability and validity of the Stanford for the hearing-impaired student population is presented. Included in this section is a discussion of the standard error of measurement and its implications in determining the significance of gains noted in scores from year to year. Section 3 contains a set of norm tables for selected subgroups of the sample. These allow more specific comparisons between individual scores and referenced norm groups than do the previously published norms computed on the entire sample. Separate decile tables are provided for the following subgroups:

1. Each of the four regions of the United States—Northeast, Midwest, South, and West
2. Each of three types of educational programs—residential schools, day schools, and local schools with hearing students
3. Each of three levels of hearing loss—less-than-severe, severe, and profound
4. Each of two additional handicap status groups—students *with no* reported handicaps in addition to their hearing-impairment and students *with* additional handicaps
5. Each of three ethnic groups—White non-Hispanic, Black, and Hispanic

Sections 1 and 2 of this manual will be useful for researchers who wish to know the technical properties of the Stanford when it is administered to hearing-impaired students. It will also be helpful for researchers engaged in future large-scale normings of standardized tests with this population. The discussion of standard error will be beneficial to educators who wish to interpret longitudinal Stanford data for their students. The validity discussion is designed to help educators decide if the content measured by the Stanford Reading Comprehension and Mathematics Computation subtests is adequately matched to their curricula. Section 3 enables educators to be more specific about the normative comparisons they can use to make judgments about their students' academic abilities.

This manual is intended to supplement rather than replace previously published material that contains important technical information about the Stanford Achievement Test for use with hearing-impaired students. The reader is directed to the following publications for additional information.

Allen, T. E. (1984). Interpreting the new Stanford Achievement Test for hearing-impaired students. *Perspectives, 2*,21-23.

Allen, T. E. (1984). *Out-of-level testing with the Stanford Achievement Test (Seventh Edition): A procedure for assigning students to the correct battery level.* Washington, D.C: Gallaudet Research Institute Monograph Series 1.

Center for Assessment and Demographic Studies. (1983). *Administering the 1982 Stanford Achievement Test (Seventh Edition) to hearing-impaired students.* Washington, D.C.: Gallaudet Research Institute.

Hotto, G., & Schildroth, A. (1984). *A resource for educators and parents of hearing-impaired students: Seventh Edition Stanford Achievement Test for use with hearing-impaired students.* Washington, D.C.:Center for Assessment and Demographic Studies.

CADS gratefully acknowledges the students and staff from the more than 600 individual schools that participated in the norming project. The names of the 154 programs that served as coordinating reporting sources are listed in the Appendix. Without their support, this important project would have been impossible.

DESCRIPTION OF THE NORMING SAMPLE

Sampling Procedures

The goal of the norming project was to compute Stanford Achievement Test norms for a sample that adequately represented the population of hearing-impaired students receiving special education services in schools throughout the United States. This population was defined by the data base created through the Annual Survey of Hearing-Impaired Children and Youth. This data base, maintained by the Gallaudet Research Institute's Center for Assessment and Demographic Studies (CADS), contains demographic and educational information for a large sample of hearing-impaired students receiving special education services. Due to logistical and financial considerations, it was not possible to randomly select *students* from the Annual Survey data base for participation in the project. Instead, *programs* were randomly selected from those which participated in the 1980–1981 Annual Survey. An attempt was made to stratify the programs in such a way that the resulting student sample would be representative.

All of the programs that participated in the 1980–1981 Annual Survey were classified by region of the country and by program type. Table 1.1 shows the four Bureau of the Census regions used to stratify the sample and indicates the states (and territories) included in each.

Table 1.2 contains a listing of the different types of programs that supply data to the Annual Survey and the sam-

TABLE 1.1
Regions of the United States

Region	States/Territories
Northeast	Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Puerto Rico, Virgin Islands
Midwest	Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin
South	Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia
West	Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming, Guam

TABLE 1.2
Types of Reporting Sources in the Annual Survey and Corresponding Sampling Categories

Type of Reporting Source	Sampling Category
Residential School for the Deaf	Residential
Day School for the Deaf	Day
General Local School Program (self-contained or mainstream status unspecified)	Local
Full-time Special Education Classes within Local School Districts	
Part-time Special Education within Local School Districts	
Mixed Full- and Part-time Special Education within Local School Districts	
Multihandicapped Program	Omitted
Rehabilitation Program	
Preschool Program	
Speech and Hearing Program	
Other Education	
Other Non-Education	

pling categories to which they correspond. These include residential schools, day schools, and local schools that serve hearing-impaired students. Four types of local school programs were combined into one sampling category. This category includes both self-contained special education classes and mainstream classes within local regular schools serving hearing students. It also contains both public and private schools. Several program types enrolling special groups of students for whom the Stanford is not likely to be appropriate were not considered for inclusion in the sample. Also, students who were younger than 7 years of age and older than 19 years of age were deleted. The Stanford has limited applicability for hearing-impaired students at these ages; therefore, the project was not designed to compute normative information for these students. (In fact, because of small numbers of 7-year-olds in the resulting sample, norms were computed only for students between the ages of 8 and 19.) The 1980–1981 Annual Survey data base, used to draw the sample, contained 40,427 students in 855 programs after these two sets of deletions were made.

Table 1.3 presents the sampling plan for the norming. Column I shows the number of reporting sources in the data base in each of the 12 stratification groups defined by cross-classifying each program according to region and program type. Column II shows the total number of students attending programs in the 12 stratification groups. Column III shows the number of students needed in the sample from each group. The number was calculated for a 95% confidence level using a 3% margin of error for a proportional variable from a finite population where the population proportion was assumed to be .50. This yielded very conservative estimates of sample size. The target number was then multiplied by 1.33 to allow for a 75% response rate.

The target sample sizes listed in Column III were divided by the population sizes listed in Column II to determine the proportion of students needed from each group to adequately represent it. These proportions are listed in Column IV. The proportion of programs randomly sampled from each stratification group was equal to the proportion of students needed from that group. The number of reporting sources sampled is listed in Column V.

Finally, those programs that had participated in the pilot testing of the Stanford screening tests developed by CADS the previous year (and had not already been selected through the stratification procedure) were added to the sample. The number of programs added to each group is listed in Column VI, and the total number of programs contacted are indicated in Column VII. A total of 227 programs

TABLE 1.3

Procedures for Determining Sample Proportions Stratified on Region and Reporting Source Type

Region	I Number of Reporting Sources	II Number of Students, 1980-81 Annual Survey	III Total Number of Students Needed	IV Total Proportion of Stratification Group Needed	V Total Number of Reporting Sources to Contact	VI Additional Programs Invited	VII Total Number of Programs Contacted
Northeast							
Residential	16	2,491	985	39	-	0	-
Day	15	758	533	.70	11	0	11
Local	116	4,886	1,173	.24	28	+8	36
Midwest							
Residential	15	2,262	920	.41	6	0	6
Day	4	394	267	.68	3	+1	4
Local	178	6,867	1,200	.17	31	+11	42
South							
Residential	26	4,915	1,172	.24	7	+1	8
Day	10	382	267	.70	7	0	7
Local	299	9,105	1,266	.14	42	+16	58
West							
Residential	12	1,907	928	.49	6	0	6
Day	-	411	267	.65	4	0	4
Local	157	6,049	1,200	.20	52	+6	38
	855	40,427	10,178	.25	204	43	227

were invited to participate. Of this number, 171 agreed to participate (75%), and 154 (68%) completed all phases of the project.

Description Of Sample Characteristics

Stratification Variables

Table 1.4 shows the proportional breakdown of the sample into stratification groups. Since day school students represented a small proportion of the total sample, they were combined with residential school students for the purpose of analyzing sample characteristics. Comparisons to the 1982-1983 Annual Survey are also included. It is clear that, in the norming sample, students from residential and day schools were overrepresented and local public school students were underrepresented. Roughly two thirds of the students reported to the Annual Survey were from local schools; one third, from special schools. Nearly two thirds of the *sample*, however, were from special schools.

This deliberate bias in the sample toward special school students resulted because the sampling strategy used sought to represent adequately each of the twelve groups of students designated in Table 1.3. Doing so resulted in a total sample that does not fully represent the population as a whole with respect to its program type composition. Many public school programs have only a few hearing-impaired students. To select programs in such a way that the sample would have contained local school students in proportion to their numbers in the Annual Survey would have nearly doubled the number of reporting sources needed for the project. To explore the effects of this bias on the resulting score distributions, the sample was weighted for several analyses. The results of these analyses are presented in the Weighted Sample Analysis section (page 6).

TABLE 1.4

Comparisons of 1983 Norming Sample with the 1983 Annual Survey With Respect to Stratification Characteristics

Stratification Groups	Norming Sample N = 7,557	1982-83 Annual Survey N = 43,830*
Northeast		
Residential/Day Schools	14.1%	9.1%
Local School Districts	7.5%	12.6%
	Total % = 21.6	Total % = 21.7
Midwest		
Residential/Day Schools	15.5%	6.9%
Local School Districts	10.5%	16.6%
	Total % = 26.0	Total % = 23.5
South		
Residential/Day Schools	22.1%	14.7%
Local School Districts	12.7%	21.6%
	Total % = 34.8	Total % = 36.3
West		
Residential/Day Schools	10.0%	6.7%
Local School Districts	7.6%	11.8%
	Total % = 17.6	Total % = 18.5
Program Type Totals Across Regions		
Residential/Day Schools	61.7%	37.4%
Local School Districts	38.3%	62.6%

*This number represents students in the Annual Survey who were between the ages of 7 and 19 in the spring of 1983 and who were reported to the survey by residential, day, or local district special education programs.

TABLE 1.5

Demographic Profile of 1983 Norming Sample Compared to 1983 Annual Survey*

	1983 Norming Sample	1983 Annual Survey
Age		
7	2.3%	5.5%
8	4.7%	6.2%
9	5.3%	6.4%
10	7.8%	6.3%
11	7.7%	7.3%
12	7.8%	7.5%
13	8.2%	7.8%
14	8.8%	7.8%
15	8.3%	7.5%
16	8.7%	7.5%
17	12.2%	11.1%
18	16.9%	14.2%
19	3.4%	5.0%
	N = 7,624	N = 43,830
	(1.7% missing)	(0% missing)
Sex		
Male	53.3%	53.7%
Female	46.7%	46.3%
	N = 7,730	N = 43,830
	(0.3% missing)	(0% missing)
Ethnic Background		
White	65.9%	67.7%
Black	18.3%	18.5%
Hispanic	12.2%	10.0%
Other, or Multi-Ethnic	3.6%	3.7%
	N = 7,740	N = 42,558
	(0.2% missing)	(2.9% missing)
Hearing Loss		
Less-than-severe	17.6%	34.3%
Severe	25.3%	21.3%
Profound	57.1%	44.4%
	N = 7,662	N = 43,047
	(1.2% missing)	(1.8% missing)
Additional Handicaps		
None	73.8%	68.8%
Physical only	9.9%	8.8%
Cognitive (with and without physical)	16.3%	22.4%
	N = 7,523	N = 42,099
	(1.7% missing)	(3.9% missing)
Age at Onset of Hearing Loss		
Prelingual (0-2 years)	94.8%	92.8%
Postlingual (3 years or older)	5.2%	7.2%
	N = 6,915	N = 35,787
	(10.9% missing)	(18.4% missing)
Cause of Deafness		
Maternal Rubella	35.6%	30.0%
Meningitis	12.1%	10.9%
Heredity	19.2%	18.3%
Otitis Media	2.3%	4.6%
Other at birth	12.4%	14.5%
Other after birth	9.4%	10.6%
Other not listed	9.0%	11.1%
	N = 5,080	N = 36,868
	(34.5% missing)	(38.7% missing)

*See note for Table 1.4

Demographic Variables

Table 1.5 shows the distribution of the sample for selected demographic characteristics. The percentages from the 1982–1983 Annual Survey are also given. In regard to age, the very youngest students (7-, 8-, and 9-year-olds) were slightly underrepresented in the sample, and the oldest students (18-year-olds) were overrepresented. Norms were not computed for 7-year-olds due to their small numbers.

The distribution of males and females was virtually identical in the sample and the Annual Survey, as was the distribution of whites, blacks, and Hispanics. Many students with less-than-severe hearing losses were not selected in the sample: This category included only 17.6% of the sample, compared to 34.3% reported from the Annual Survey. This fact is undoubtedly related to the underrepresentation of local school students since, as previous research has shown (Allen & Osborn, 1984; Wolk, Karchmer, & Schildroth, 1982), program placement is related to hearing loss.

It also appears that many students with additional cognitive handicaps were systematically excluded from the sample. Cognitive handicaps include mental retardation, specific learning disabilities, and social-emotional problems. While only 16.3% of the sample were reported with such handicaps, 22.4% of the Annual Survey were. If only physical handicaps are considered, such as cerebral palsy, visual problems, etc., little difference is noted between the norming sample and the Annual Survey.

Finally, there were no dramatic differences between the sample and the Annual Survey with respect to age at onset and cause of deafness. A slightly higher proportion of students in the sample was prelingually deaf. Again, this is undoubtedly related to program type: Prelingually deaf students would be found in greater proportion among special school students who, as we have seen, are overrepresent-

ed in the sample. Also, a slightly higher percentage of the sample reported maternal rubella as a cause of deafness. This would be expected from the age differences noted earlier since the sample had a slightly higher proportion of 18-year-olds, students born during the rubella epidemic of 1964–1965.

In sum, the norming sample differed from the Annual Survey from which it was drawn in three important ways. First, it was more heavily weighted toward special school students. Second, there were fewer students in the sample with less-than-severe hearing losses than would be expected from the population. Third, fewer students with additional cognitive handicaps were in the sample than would be predicted from the Annual Survey figures.

These differences imply that the highest and lowest achieving hearing-impaired students were not represented well by the sample. Mainstreamed students, especially those with less-than-severe hearing losses, were not well represented, indicating that they were not as often selected for testing with a special test adapted for hearing-impaired students. Also excluded were students with additional cognitive handicaps that, in their teachers' opinions, impeded their ability to take the test. The sample, then, most adequately represents the large number of hearing-impaired students in special education who would benefit from special procedures but who are not so cognitively handicapped that the test is determined to be too difficult for them.

Distribution of Test Level Assignments

All students in the norming sample were administered separate reading and mathematics screening tests to determine what levels of the Stanford they should take. The results of the reading screening tests were used to place students into appropriate subtest levels for Reading Comprehension and the other subtests requiring reading skills, such as Science and Social Science. The results of the math screening test were used to place students into appropriate levels of the Mathematics Computation and the Concepts of Number subtests. Assignment of students into levels of the Mathematics Applications subtest was left to the discretion of the teachers administering the test, but, since this subtest involves a strong language component, teachers were encouraged to use the results of the reading screening test for placing students into appropriate levels of this subtest.

TABLE 1.6

Number and Percent of Hearing-Impaired Students Assigned by Screening Procedure to Different Levels of the Stanford Achievement Test (7th Edition), Stanford Norming Project, 1983

	Reading Comprehension	Mathematics Computation	Mathematics Applications
Primary 1	1555 (22%)	1169 (17%)	1133 (25%)
Primary 2	1560 (22%)	621 (9%)	709 (16%)
Primary 3	1736 (24%)	1296 (18%)	986 (22%)
Intermediate 1	1082 (15%)	1826 (26%)	771 (17%)
Intermediate 2	258 (4%)	1046 (15%)	353 (8%)
Advanced	917 (13%)	1091 (15%)	539 (12%)
Total	7108 (100%)	7049 (100%)	4491 (100%)

Table 1.6 presents the distribution of test level assignments for Reading Comprehension, Mathematics Computation, and Mathematics Applications. The total number of students assigned to Mathematics Applications levels (4,491) is considerably smaller than the total number of students assigned in the other two categories because the Mathematics Applications subtest is an optional subtest. Table 1.6 shows the number of students assigned to different levels of the battery for different subtests. In general, students were assigned to higher levels of the battery for their mathematics subtests than

for their reading subtests. This result is consistent with a wealth of previously published research which shows that hearing-impaired students, as a group, are farther behind their hearing peers in the development of reading skills than in the development of mathematics skills (e.g., Allen & Karchmer, 1981; Trybus & Karchmer, 1977; Wolk & Allen, 1984).

Weighted Sample Analysis

To explore the effects of differences in characteristics between the sample and the Annual Survey, the sample was weighted for analysis. All students were classified according to responses to the following questions:

Did they attend a special school (residential or day) or a local school program?

Were they less-than-severely, severely, or profoundly deaf?

Did they have no additional handicaps, additional physical handicaps, or additional cognitive handicaps?

Based on their classifications with regard to these questions, students were placed into 1 of 18 cells defined by cross-classifying on the two levels of program type, three levels of hearing loss, and three levels of additional handicap status. For each age cohort, relative frequency distributions were determined for the 18 cells. The same operation was performed for the Annual Survey. Then, students in the sample were weighted by the ratio of the Annual Survey relative frequency to the sample relative frequency for the particular cell defined by their program type, hearing loss, and additional handicap status characteristics. The weighting resulted in a sample of the same size as the norming sample, but "matched" the Annual Survey on these characteristics.

Figures 1 through 5 show the results of recomputing the norms for five of the Stanford subtests based on the weighted sample. It is clear from these figures that weighting the sample had little effect on the resulting distributions. (Only the medians are plotted here; the other percentile levels have been examined and show the same similarities.) Therefore, it appears that the bias in the sample did not skew the score distributions used to compute the norms. It is possible, however, that the weighting did not overcome all sources of bias in the sample. The weighting procedure assumes that subgroups of students within the sample (e.g., those who are mainstreamed) adequately represent the students not in the sample who have the same characteristics. Since teachers in local schools used their judgment in selecting which students should take the Stanford (as adapted for hearing-impaired students), it is possible that those selected for the sample were not representative of those not selected, even though they have the same demographic characteristics.

This potential sampling bias is not as detrimental to interpreting the norms adequately as it may appear. Certainly the sample represents special education students who are normally selected for special achievement testing. Educators should be aware, however, that the percentiles they obtain for their hearing-impaired students do not place them among *all* hearing-impaired students in a particular age group, but among those who are normally selected for special achievement testing.

FIGURE 1

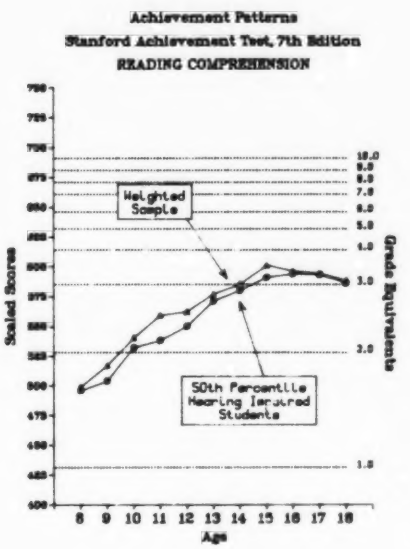

FIGURE 2

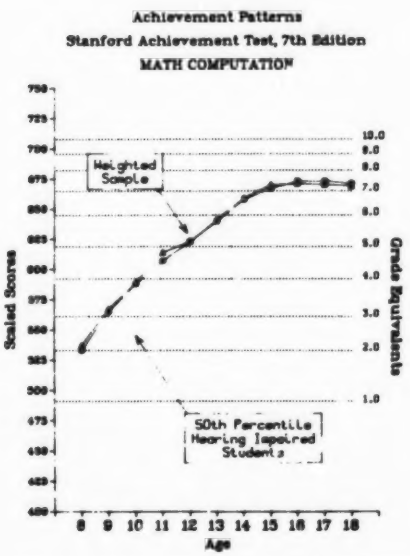

FIGURE 3

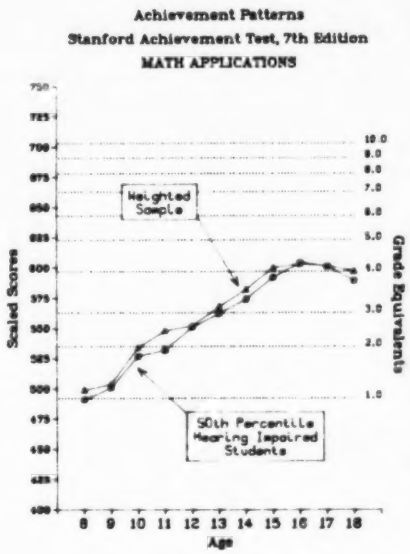

FIGURE 4

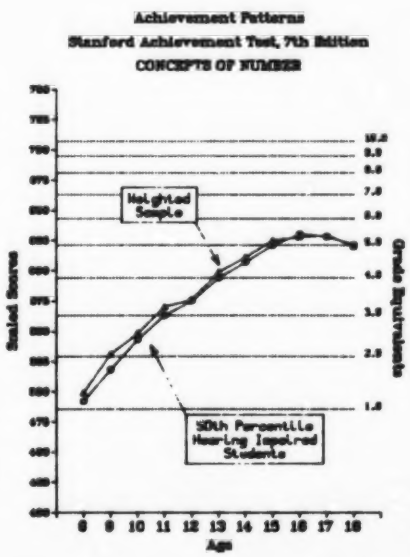

FIGURE 5

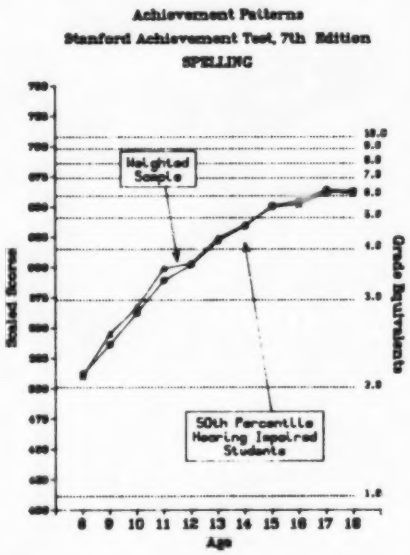

TABLE 2.1

Sample Sizes, Means, Standard Deviations, K-R 20 Reliability Coefficients, and Standard Errors of Measurement: Stanford Achievement Test (7th Edition), Hearing-Impaired Norming Sample, Stanford Norming Project, 1983

	Required Subtests		Test Level			
Subtest	P1	P2	P3	I1	I2	Ad
Word Reading						
N	1866	1749	(subtest does not appear at these levels)			
Mean	24.7	21.9				
SD	6.3	5.5				
N Items	33	33				
K-R 20	.89	.83				
Standard Error	2.1	2.3				
Reading Comprehension						
N	1867	1753	1949	1225	291	1055
Mean	23.9	22.5	35.0	33.7	31.2	32.8
SD	7.0	5.8	8.4	10.7	9.7	11.1
N Items	40	40	60	60	60	60
K-R 20	.85	.80	.91	.89	.89	.91
Standard Error	2.7	2.6	3.3	3.2	3.2	3.3
Spelling						
N	1703	1671	1919	1204	286	1048
Mean	22.7	20.3	29.2	32.3	37.6	35.7
SD	6.2	7.1	5.7	6.4	8.2	8.5
N Items	30	30	36	40	50	50
K-R 20	.90	.91	.89	.89	.90	.90
Standard Error	2.0	2.1	1.9	2.1	2.6	2.7
Language						
N	(subtest does not appear at these levels)		1922	1200	281	1046
Mean			24.3	31.6	32.6	34.9
SD			6.4	6.7	5.5	8.6
N Items			46	53	53	59
K-R 20			.78	.79	.66	.85
Standard Error			3.0	3.1	3.2	3.3
Concepts of Numbers						
N	1520	668	1455	2044	1155	1252
Mean	19.7	20.3	19.0	18.0	19.9	20.6
SD	5.9	5.7	5.9	6.4	5.1	6.1
N Items	34	34	34	34	34	34
K-R 20	.82	.81	.83	.84	.76	.84
Standard Error	2.5	2.5	2.4	2.6	2.5	2.4
Mathematics Computation						
N	1529	663	1464	2039	1160	1254
Mean	15.4	29.7	31.0	33.0	33.4	28.2
SD	5.5	5.3	7.7	7.1	6.1	7.5
N Items	22	38	42	44	44	44
K-R 20	.89	.83	.90	.88	.84	.87
Standard Error	1.8	2.2	2.4	2.5	2.4	2.7

RELIABILITY AND VALIDITY ANALYSIS

Reliability

Two measures of reliability were computed for the Stanford test score data: internal consistency (K-R 20 formula) and parallel forms. The latter was based on a special study of the relationship between hearing-impaired students' performance on Forms E and F of the Stanford Achievement Test. The methodology for this study is described more fully in the Parallel Forms section (page 10).

Internal Consistency

As specified in the special instructions for teachers administering the Stanford to hearing-impaired students (CADS, 1984a), the subtests in the Stanford are divided into three categories of appropriateness: Category 1, those that are most often appropriate for hearing-impaired students; Category 2, those that are sometimes appropriate (depending on the individual students and their curricula); and Category 3, those that are rarely appropriate. In the norming project, all students in the sample were required to take the subtests from Category 1; Category 2 and Category 3 subtests were optional. Norms were not computed for Category 3 subtests. It should be noted that the optional nature of the Category 2 subtests for the norming sample imposes some restrictions on the interpretation of those norms. (See Allen, 1984a, for a discussion of interpreting percentiles for Category 2 subtests.)

Table 2.1 presents the K-R 20 reliability information for the required Category

1 subtests, and Table 2.2 presents the same for the optional Category 2 subtests. The reliabilities for all of the required subtests except Language are predominantly above 80. For Language, the reliabilities are between 70 and 80 for the Primary 3 and Intermediate 1 levels, 66 for Intermediate 2, and 85 for the Advanced level of the test. Concepts of Numbers is 76 at the Intermediate 2 level but above 80 at all other levels. Reading Comprehension, Spelling, and Mathematics Computation are above 80 at all levels of the test.

As is evident from Table 2.2, the Environment subtest, which appears only at the Primary 1 and Primary 2 levels of the test, is not highly reliable. All other optional subtests have reliabilities similar in range to those noted for the required subtests. It should be remembered that students tested with these optional subtests are those for whom teachers made independent judgments about the subtests' appropriateness. It is not possible to judge what the reliability coefficients would be if these subtests had been required of the entire sample.

In general, Tables 2.1 and 2.2 show that the Category 1 and Category 2 subtests of the Stanford have excellent reliability for the hearing-impaired student population, although the Environment subtest at the Primary 1 and Primary 2 levels and the Language subtest at the Primary 3 through Advanced levels are somewhat less reliable than the others.

The standard errors of measurement (SEM) are also given in Tables 2.1 and 2.2.These are expressed in terms of raw score points. They present a clearer picture than do the reliability coefficients alone of the degree of accuracy of the measures by allowing the construction of intervals around observed scores within which it can be fairly certain that the students' true scores lie. A more comprehensive discussion of standard error is presented in the section, A Further Discussion of Standard Error (page 11).

The Primary 1 Mathematics Computation and Applications subtest requires a comment. At that level of the test the two subject areas are combined into one 45-item test. Since hearing-impaired students often have more difficulty with the Applications portion of that combined subtest, the CADS norms for hearing-impaired students separate the subtest into its two sections. The Mathematics Computation section contains 22 items; the Mathematics Applications section contains 23 items. Reliabilities for the separate sections of the subtest are given in Tables 2.1 and 2.2.

TABLE 2.2

Sample Sizes, Means, Standard Deviations, K-R 20 Reliability Coefficients, and Standard Errors of Measurement: Stanford Achievement Test (7th Edition), Hearing-Impaired Norming Sample, Stanford Norming Project, 1983

	Optional Subtests					
	Test Level					
Subtest	P1	P2	P3	I1	I2	Ad
Environment						
N	924	895	(subtest does not appear at these levels)			
Mean	14.0	14.9				
SD	4.1	4.1				
N Items	27	27				
K-R 20	.66	.68				
Standard Error	2.4	2.3				
Science						
N	(subtest does not appear at these levels)		1058	644	168	644
Mean			21.9	36.7	34.8	34.7
SD			6.3	8.4	7.5	11.6
N Items			44	60	60	60
K-R 20			.79	.84	.79	.92
Standard Error			2.9	3.4	3.4	3.3
Social Studies						
N	(subtest does not appear at these levels)		1100	674	177	640
Mean			22.2	34.0	31.7	35.5
SD			7.2	11.1	9.3	11.5
N Items			44	60	60	60
K-R 20			.84	.91	.87	.92
Standard Error			2.9	3.3	3.4	3.3
Mathematics Applications						
N	1529	761	1092	863	395	644
Mean	11.7	19.7	19.8	21.5	19.3	20.4
SD	4.6	6.2	7.1	8.5	7.9	8.1
N Items	23	35	38	40	40	40
K-R 20	.80	.84	.87	.90	.88	.88
Standard Error	2.1	2.5	2.6	2.7	2.7	2.8

TABLE 2.3

Sample Sizes, Means, Standard Deviations, of Required Subtests Forms E and F, Stanford Achievement Test (7th Edition), and Parallel Forms Reliability Coefficients for Hearing Impaired Students, 1984

Required Subtests

Subtest	Test Level					
	P1	P2	P3	I1	I2	Ad
Word Reading						
N	122	158	(subtest does not appear at these levels)			
N Items	33	33				
Mean Form E	20.5	22.2				
SD Form E	5.7	4.9				
Mean Form F	24.4	22.6				
SD Form F	6.3	4.8				
R(E,F)	.79	.72				
Reading Comprehension						
N	130	177	202	131	46	73
N Items	40	40	60	60	60	60
Mean Form E	23.8	22.0	35.3	37.1	32.7	36.3
SD Form E	7.8	5.4	8.6	10.8	9.3	8.9
Mean Form F	25.3	21.7	30.2	32.7	29.2	36.7
SD Form F	7.2	5.4	8.4	9.8	10.1	8.9
R(E,F)	.56	.66	.65	.75	.69	.84
Spelling						
N	114	157	181	128	41	66
N Items	30	30	36	40	50	50
Mean Form E	23.1	19.9	28.6	31.0	36.8	36.4
SD Form E	6.0	6.7	6.0	6.1	8.4	7.3
Mean Form F	22.7	21.2	29.5	31.8	38.2	36.4
SD Form F	6.6	5.7	6.0	6.5	7.0	7.8
R(E,F)	.85	.81	.80	.87	.91	68
Language						
N	(subtest does not appear at these levels)		179	127	41	65
N Items			46	53	53	59
Mean Form E			23.3	31.8	32.2	36.2
SD Form E			6.1	6.5	6.0	8.7
Mean Form F			23.2	31.0	30.9	37.4
SD Form F			6.3	6.2	6.2	7.6
R(E,F)			.79	.65	.62	.82
Concepts of Numbers						
N	104	74	162	191	97	124
N Items	34	34	34	34	34	34
Mean Form E	20.5	18.9	18.8	18.0	21.2	21.5
SD Form E	4.9	5.3	5.8	6.3	4.5	6.4
Mean Form F	19.4	19.2	18.5	18.9	21.3	21.6
SD Form F	5.4	5.6	5.9	6.1	4.5	6.4
R(E,F)	.70	.64	.76	.82	.79	.86
Mathematics Computation						
N	109	79	172	191	100	125
N Items	22	38	42	44	44	44
Mean Form E	16.1	29.9	30.8	32.4	34.7	29.0
SD Form E	5.2	4.9	8.0	7.6	5.5	8.1
Mean Form F	16.1	28.8	30.9	33.1	35.2	29.4
SD Form F	5.3	6.2	8.0	7.5	5.6	8.5
R(E,F)	.83	.72	.81	.78	.69	.83

Parallel Forms

A study was conducted by CADS during the 1983–1984 school year to determine the relationship between the two published forms of the 7th Edition of the Stanford (Forms E and F). In the project, 805 hearing-impaired students from 13 programs randomly sampled from those participating in the 1983 norming took selected subtests from both forms of the test within a two-week period. Half of the participating programs were requested to administer Form E first; the others were requested to administer Form F first. As with the norming, programs were asked to administer the required Category 1 subtests from both forms of the test; Category 2 subtests were again optional.

Table 2.3 presents the means and standard deviations of the raw scores for the required subtests for both forms. It also presents the Form E-Form F correlation coefficients, R(E,F), for each of the subtests. These correlations represent the parallel forms reliabilities. Table 2.4 presents the same information for the optional subtests.

In general, the reliability estimates from the parallel forms analysis are somewhat lower than the estimates based on the internal consistency analysis. This is expected since these estimates are derived from two different test administrations. They are therefore associated with more sources of error than are estimates based on only one test administration. Nonetheless, almost all of the reliabilities reported are greater than 65, and many are above 80. These values indicate a high level of consistency between the scores obtained on the two tests. The parallel forms reliability coefficient for the Reading Comprehension subtest at the Primary 1 level is only .56, indicating that scores obtained from this subtest are perhaps less accurate than scores obtained from other subtests. Greater care should be given in interpreting scores from this test. The Environment

subtest at the Primary 1 and Primary 2 levels of the battery obtained low parallel forms reliabilities of 46 and 45, respectively. Given that the internal consistency estimates were also low for these subtests, it is reasonable to question the usefulness of these tests for hearing-impaired students.

The mean raw scores and their standard deviations obtained on the various subtests were highly consistent across forms of the test, indicating that the Form E and Form F score distributions were highly similar. In only a few instances did the mean raw scores of the two forms of the same subtest differ by more than three points. However, these instances reveal a systematic pattern. They include the following:

- Primary 3 Reading Comprehension (Form E easier)
- Intermediate 1 Reading Comprehension (Form E easier)
- Intermediate 2 Reading Comprehension (Form E easier)
- Intermediate 1 Science (Form E easier)
- Advanced Science (Form E easier)
- Advanced Social Science (Form E easier)

When differences in mean performance levels of individual subtests were more than three raw score points (roughly one standard error), it was always Form E that had a higher mean raw score. This pattern occurred at three levels of the Reading Comprehension subtest. Investigation into the reason why Form E was easier for some subtests (especially Reading Comprehension) should be undertaken.

The results of the parallel forms analysis show that Form E and Form F of the test are highly correlated. Programs that choose to use Form F can do so and expect results similar to those they would obtain with Form E. On the other hand, the scores are not interchangeable, and administering different forms of the test for the purpose of tracking longitudinal achievement gain should not be done. The results also do not warrant using Form F scaled scores to determine the hearing-impaired student percentile ranks from the Form E norm tables.

TABLE 2.4

Sample Sizes, Means, Standard Deviations, of Optional Subtests Forms E and F, Stanford Achievement Test (7th Edition), and Parallel Forms Reliability Coefficients for Hearing-Impaired Students, 1984

		Optional Subtests					
		Test Level					
Subtest		P1	P2	P3	I1	I2	Ad
Environment							
	N	39	84	(subtest does not appear at these levels)			
	N Items	27	27				
	Mean Form E	13.9	15.0				
	SD Form E	3.2	3.7				
	Mean Form F	13.8	15.5				
	SD Form F	3.1	3.9				
	R(E,F)	.46	.45				
Science							
	N	(subtest does not appear at these levels)		89	42	*	29
	N Items			44	60	*	60
	Mean Form E			22.0	38.8	*	38.9
	SD Form E			6.0	9.2	*	8.6
	Mean Form F			22.9	35.3	*	35.7
	SD Form F			7.2	10.2	*	7.0
	R(E,F)			.73	.78	*	.70
Social Science							
	N	(subtest does not appear at these levels)		91	45	*	29
	N Items			44	60	*	60
	Mean Form E			23.3	37.1	*	39.4
	SD Form E			6.0	8.4	*	8.4
	Mean Form F			24.3	35.7	*	33.3
	SD Form F			6.2	8.8	*	10.3
	R(E,F)			.81	.80	*	.86
Mathematics Applications							
	N	102	40	94	110	63	74
	N Items	23	35	38	40	40	40
	Mean Form E	12.2	16.8	15.9	17.0	19.8	21.2
	SD Form E	3.8	6.8	6.0	7.9	8.0	9.6
	Mean Form F	11.7	17.3	15.4	17.3	20.4	22.3
	SD Form F	4.2	6.2	5.5	7.2	8.5	8.7
	R(E,F)	.68	.68	.73	.89	.88	.84

*The number of students responding to this subtest was insufficient for the calculation of meaningful summary statistics.

A Further Discussion Of Standard Error

In Tables 2.1 and 2.2, the standard errors of measurement are given for the Stanford subtests. This section of the manual presents some illustrations of how these standard errors can be used to de-

termine the level of accuracy of student scores obtained from the Stanford.

The most important point is that the standard errors are expressed in raw score points, *not* scaled score or grade equivalent points. This fact is important because, if the standard error is used to construct an interval around an observed score within which a student's "true" score probably lies, it will be noted that intervals of similar raw score width can convert to vastly different norm ranges, depending on the level of the test and the value of the observed raw score.

Table 2.5 illustrates this point. On the Reading Comprehension subtest, Student 1 obtains a raw score of 20 at the Primary 1 level. Student 2 obtains the same raw score at the Intermediate 2 level. Student 3 also takes the Intermediate 2 level, but scores 50, which is near the top of the range. (There are 60 items on this test.) Student 1's raw score converts to a grade equivalent of 1.3 and a scaled score of 458. Student 2's raw score converts to a grade equivalent of 3.1 and a scaled score of 590. Student 3's raw score converts to a grade equivalent of 10.0 and a scaled score of 690. The question to be answered is, "To what extent can these scores be taken at face value?"

TABLE 2.5

Standard Error Illustrations Using Example Scores from Reading Comprehension Subtests

	Student 1 Primary 1	Student 2 Intermediate 2	Student 3 Intermediate 2
Raw Score	20	20	50
Grade Equivalent	1.3	3.1	10.0
Scaled Score	458	590	690
Standard Error	2.7	3.2	3.2
95% CI (1.96xSE)	± 5.3	± 6.3	± 6.3
Ranges			
Raw Score	15 to 25	14 to 26	44 to 56
Grade Equivalent	1.1 to 1.5	2.7 to 3.8	7.5 to Post High School
Scaled Score	437 to 478 (41 pts)	569 to 609 (40 pts)	665 to 730 (65 pts)

The standard errors for these three situations are shown in Table 2.5. To determine the accuracy of a measure, construct an interval within which it can be 95% certain that an individual's true score will fall. This interval is simply computed by multiplying the standard error by 1.96 (the z- score associated with the 95% confidence interval) and then adding and subtracting the resulting value to and from the observed score.

These computations have been performed for the three examples. The 95% confidence interval around Student 1's observed score of 20 ranges from 15 (20 minus 5.3) to 25 (20 plus 5.3). The range for Student 2 is 14 to 26 (note that the observed score of 20 is a little less accurate for Intermediate 2 than it is for Primary 1); the range for Student 3 is from 44 to 56. (Student 3's score is from the same test as that taken by Student 2 and therefore has the same standard error.)

Another way of describing these confidence intervals is to say, "If Student 1 were to take the Primary 1 Reading Comprehension subtest 100 times (assuming the test questions were not remembered), the student would obtain a raw score between 15 and 25 in 95 of those test administrations." The width of this range is directly related to reliability. The higher the reliability of a test, the narrower the confidence interval and the more precise the measure.

The more interesting aspects of these examples come when the raw scores defined by the upper and lower values of the intervals are converted to norms. For Student 1, the converted grade equivalent range becomes 1.1 to 1.5. These values correspond to the raw scores 15 and 25 for the Primary 1 Reading Comprehension subtest. It could be said that Student 1's "true" grade equivalent falls somewhere between 1.1 and 1.5. Not nearly as accurate a statement can be made about Student 2's grade equivalent. The 95% confidence interval yields a grade equivalent range from 2.7 to 3.8. For student 3

the degree of precision becomes less. The converted confidence interval for grade equivalents yields a range from 7. 5 to post high school.

The grade equivalent difference between Student 1 and Student 3 is striking. Student 1's reported 1.3 grade equivalent suggests that the student's "true" achievement level is somewhere in the first half of the first grade. The reported grade equivalent for Student 3 gives far less information. Student 3's results imply a grade equivalent that could be anywhere beyond the 7th-grade level.

These illustrations lead to the following two rules for interpreting test results: (1) No score is completely accurate; all reported scores should be interpreted as representing a range of scores; (2) the standard error is not of constant size across subject areas and test levels, especially when one is talking about converted scores. It cannot generally be said, for example, "Six months' grade equivalency growth constitutes significant gain after accounting for error due to unreliability." In the examples, such an assertion would be warranted for Student 1 but not for Students 2 and 3. Rather, a separate judgment about a significant gain would have to be made about each individual student's scores. If the score ranges for two scores on a subtest obtained at different testing times do not overlap, the gain (or loss) could be labelled "significant."

One possible implication of Table 2.5 is that the results for Student 3 are not interpretable, and discussion of these results with parents and educators might easily lead to confusion. However, it should be noted that the scaled score confidence interval is only 20 points wider for Student 3 than it is for Students 1 and 2, indicating that the difference in the precision of these two scores is not as great as the grade equivalent intervals would imply. The reason for this disparity is that grade equivalents do not form an equal interval scale, whereas the scaled scores do. The range from 7.5 to post high school seems enormously wide, but in terms of actual difference in skill level it is not. Students in the early grades gain reading comprehension skills at a much faster pace than do students in the later grades. Therefore, in determining significant growth a student's starting position must be considered along with information about test reliability.

Validity

The validity of a test cannot be determined without knowledge of its purpose. Since the Stanford is the only large-scale standardized achievement test that has been adapted for use with hearing-impaired students, it is widely used for many purposes. Very little statistical data have been published to support the extent to which the battery is used validly. However, individual situations are known where the Stanford has been used in ways that support assertions about its validity in several contexts. In one school, for example, results of the Reading Comprehension and Mathematics Computation subtests were highly correlated with a measure of IQ. These correlations are evidence for the construct validity of the Stanford.

In another situation, the Stanford was administered to a group of entering preparatory and freshmen students at Gallaudet College. The students' scores on the Stanford were found to be related to both grade point average and attrition after one semester. These findings support a notion of criterion-related validity for the Stanford, i.e., the Stanford as a predictor of success at college.

The most compelling evidence to date for the content validity of the 7th Edition Stanford concerns the relationship between the objectives measured by the test and hearing-impaired students' curricula. Harnisch and Allen (in preparation) conducted a study of the linkage between the Mathematics Computation and Reading Comprehension subtests of the Stanford and the curricula offered in special edu-

cation programs serving hearing-impaired students throughout the United States.

Data for the Harnisch and Allen study were collected at the time of the norming. For a random subsample of over 2,500 students from the larger norming sample, each student's teacher(s) were asked to evaluate how much opportunity the students had had to learn the content tested by particular items. Twelve different questionnaires corresponding to the six Mathematics Computation subtests and the six Reading Comprehension subtests were sent to the teachers. The students had been divided into 12 groups based on their screening test results and on random assignment.

The six mathematics questionnaires asked teachers to respond to two questions about each computation subtest item appearing in the test booklet taken by the targeted student: (1) To what extent has this student had an opportunity to learn the content of this item (not at all, minimally, adequately, or heavily?), and (2) Will the student answer the item correctly (yes or no)? Since it would have been difficult for teachers to respond to the same questions about each and every Reading Comprehension item, the six Reading Comprehension questionnaires asked the same opportunity-to-learn and expectation questions about groups of items appearing on the test. These groups were predefined by the test publisher as representing the different content categories measured by the test.

TABLE 2.6

Mean Percentage of Items Within Stanford Mathematics Computation Content Categories Reported as Being Adequately or Heavily Covered and Mean Percentage of Items Answered Correctly Within Each Category: Stanford Norming Project, 1983

Content Category**	Test Level*					
	P1	P2	P3	I1	I2	Ad
	(Numbers are percentages)					
Add, whole numbers				89 (84)	87 (87)	
Addition facts	75 (69)	83 (83)				
Three 1-digit addends	74 (79)					
Addition, no renaming	72 (76)	93 (89)	86 (88)			
Addition, with renaming		89 (76)	89 (83)			
Missing addends			71 (82)			
Subtraction, whole numbers					91 (83)	
Subtraction facts	78 (70)	91 (75)				
Subtraction, no renaming	63 (62)	92 (81)	85 (78)	93 (87)		
Subtraction, with renaming		87 (33)	88 (53)	91 (72)		
Multiplication, whole numbers					85 (87)	87 (84)
Multiplication facts		71 (75)	79 (79)	69 (84)		
Multiplication numbers <10			72 (67)	86 (88)		
Multiplication 2-digit numbers				79 (70)		
Division, whole numbers						85 (79)
Division facts			71 (72)	89 (80)	90 (96)	
Division, numbers <10			60 (43)		89 (79)	
Division, 1 & 2 digit divisors				76 (63)	84 (75)	
Computations, fractions & decimals				62 (65)		
Computations with decimals					80 (81)	
Decimals, addition & subtraction						85 (85)
Decimals, multiplication & division						80 (71)
Computations with fraction					72 (56)	
Fractions, addition & subtraction						84 (47)
Fractions, multiplication & division						81 (57)
Percent						50 (41)
Estimation				35 (32)	48 (67)	45 (60)
Proportions					56 (76)	
Proportions, linear equations						48 (52)

*Actual performance means of the curriculum study subsamples are given in parentheses.

**The content categories listed are mutually exclusive within level.

Table 2.6 shows the mean curriculum coverage scores and the mean actual performance scores on all of the content categories assessed in each of the six Mathematics Computation subtests. A coverage score for an individual student is the percentage of items within a content cluster reported by the teacher as being adequately or heavily covered in the curriculum of the individual student. Thus, the 75 appearing in Table 2.6 under Primary 1 Addition Facts indicates that the mean percentage of items covering "addition facts" reported by teachers as being adequately covered in the curricula of programs for hearing-impaired students was 75. The 69 is the mean percentage of items answered correctly by students who took the Primary 1 Mathematics Computation subtest.

In general, Table 2.6 reveals that the level of coverage of mathematics objectives appearing on the Stanford is consistently high and that performance on these ob-

jectives co-varies with coverage. In other words, coverage is generally good, and lower performance is usually associated with poorer curricular coverage. There are three qualifications to this statement. First, the more difficult objectives appearing only at the upper levels of the test are not as well covered as the objectives at the lower levels. These upper level objectives include percent, estimation, proportions, and linear equations. Second, subtraction with renaming remains very difficult for hearing-impaired students (the performance means are low) through the Primary 3 level, despite very high levels of coverage. Third, computation with fractions remains difficult at the upper levels of the test, despite moderately high levels of coverage.

Table 2.7 shows similar results for the Reading Comprehension content categories. Since the reading comprehension questionnaires asked questions at the content category level and not the individual item level, the coverage scores reported in Table 2.7 have a slightly different interpretation than those reported in Table 2.6. The numbers in Table 2.7 are the percentages of students in the sample reported as having had adequate opportunity to learn the content represented by the category. Thus, the 46 appearing under Primary 1 two-sentence stories indicates that only 46% of the students in the Primary 1 Reading Comprehension sample were reported to have had adequate to heavy coverage of this content category.

As with Mathematics Computation, coverage levels of the Reading Comprehension categories were fairly high throughout. There is one notable exception: The two-sentence story category appearing at the Primary 1 level is not well covered in the curricula of these programs, and students do not perform very well on items representing this category. Furthermore, inferential comprehension was somewhat less well covered for students at the Primary 3 and Intermediate 1 levels of the test than was coverage of literal comprehension. Performance on inferential comprehension items lagged behind the performance of literal comprehension items at each of the four upper levels of the battery.

Tables 2.6 and 2.7 show that, in general, the Stanford Math Computation and Reading Comprehension subtests have good content validity, i.e., the content areas assessed by these tests are adequately covered by the students' curricula. There are isolated content categories that are not as well covered, as has been discussed, and some content areas remain difficult for students despite high levels of coverage. The latter are areas where curriculum development is needed. The high level of coverage implies that educators feel that the content areas are important. The lower levels of performance imply, perhaps, that better teaching methods are needed.

TABLE 2.7

Percentage of Students Judged by Teachers to Have Had Adequate to Heavy Coverage of Stanford Reading Comprehension Content Categories and Mean Percentage of Items Answered Correctly Within Each Category: Stanford Norming Project, 1983

	Test Level*					
Content Category**	P1	P2	P3	I1	I2	Ad
	(Numbers are percentages)					
Two-sentence stories	46 (49)					
Cloze passages	64 (63)	74 (86)				
Short paragraphs		75 (52)				
Textual passage			68 (57)	82 (60)	74 (39)	82 (54)
Functional passages			73 (55)	78 (68)	78 (63)	73 (55)
Recreational passages			72 (65)	79 (56)	65 (61)	61 (59)
Literal items**			84 (62)	90 (68)	85 (60)	87 (61)
Inferential items**			60 (56)	68 (47)	85 (47)	78 (51)

*Actual performance means of the curriculum study subsample are given in parentheses.

**The content categories listed are not mutually exclusive. Both literal and inferential items comprised the textual, functional, and recreational categories; the same items are grouped by type of passage and by type of question to form the five groups presented in the table for the Primary 3 through Advanced levels.

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SPECIAL NORMS TABLES

Description of Special Norms

It is evident from Section 1 that the norming sample was considerably heterogeneous with respect to various demographic and educational characteristics. This heterogeneity can lead to problems in interpreting the percentiles of individual students. For example, if a particular student has cognitive handicaps in addition to a hearing impairment, it is perhaps not appropriate to use the percentiles that are based on the entire hearing-impaired student population. Similarly, it is not appropriate to compare mainstreamed students who have less-than-severe hearing losses to the larger group which includes residential school students who have profound hearing losses.

To permit more appropriate comparisons, special norms tables were prepared. The tables show, for students with specific characteristics, scaled score distributions at each age level for various Stanford subtests. Since dividing the sample considerably reduced the number of students in each norm group, only deciles are reported. Reporting individual percentile ranks requires a large sample. In some cases, the number of students comprising a norm group of a particular age and with a particular characteristic is as low as 50 students. Obviously, since percentiles divide a distribution into 100 equal intervals, these small groups are not adequate. The solution to this problem was to compute deciles for the groups of interest. (Deciles are not printed for norm groups that consist of fewer than 50 students.)

Deciles divide distributions into 10 equal parts. That is, the lowest 10% of the scorers are assigned a decile value of 1 indicating that they are in the first decile. The top scorer in this first decile has a level of performance equal to the tenth percentile. Similarly, the top 10% of the scorers are in the 10th decile. This decile corresponds to the 91st through the 100th percentile.

To use the tables to compute a special norm for an individual student, the following must be known: the student's age and Stanford Achievement Test scaled score, and the group with which an appropriate achievement comparison is to be made. An example will help explain how the special norms tables can be used. Suppose a 10-year-old student scored 464 on the Stanford Reading Comprehension subtest. Use of the regular hearing-impaired student norms (CADS, 1984b) would reveal that the student scored at the 18th percentile. However, a teacher of this student might feel that the 18th percentile, which is in the 2nd decile, is not a fair measurement since the student has additional handicapping conditions. Table 3.13 provides the special norms for students in the norming sample who had additional handicaps. For 10-year-olds with additional handicaps, the observed 464 is between 463 and 483. Therefore, this student scored in the 4th decile, i.e., between the 31st and 40th percentile among hearing-impaired students with a similar additional handicap.

Tables for the following subgroups of students are provided:

- Students residing in the Northeastern Region of the United States
- Students residing in the Midwestern Region of the United States
- Students residing in the Southern Region of the United States
- Students residing in the Western Region of the United States
- Students attending residential schools
- Students attending day schools
- Students attending residential or day schools (combined group)
- Students attending local schools with hearing students
- Students with profound hearing loss
- Students with severe hearing loss
- Students with less-than-severe hearing loss
- Students with no reported handicap(s) in addition to their hearing impairment
- Students with reported handicap(s) in addition to their hearing impairment
- White non-Hispanic students
- Black students
- Hispanic students

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students residing in the Northeastern Region

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age:8						
DECILE						
1	316-432	311-420		326-444	335-431	338-433
2	433-442	421-436		445-457	432-446	434-446
3	443-451	437-455		458-467	447-463	447-463
4	452-470	456-480		468-475	464-488	464-481
5	471-500	481-507		476-484	489-514	482-493
6	501-517	508-548		485-513	515-536	494-502
7	518-538	549-572		514-529	537-557	503-515
8	539-566	573-598		530-545	558-590	516-536
9	567-604	599-651		546-573	591-610	537-564
10	605-827	652-826		574-823	611-847	565-836
Age: 9						
DECILE						
1	316-446	311-453		326-443	335-452	338-440
2	447-460	454-473		444-469	453-498	441-462
3	461-477	474-488		470-481	499-522	463-476
4	478-489	489-515		482-503	523-548	477-492
5	490-505	516-535		504-512	549-565	493-507
6	506-528	536-555		513-526	566-580	508-516
7	529-544	556-583		527-548	581-598	517-525
8	545-559	584-601		549-577	599-632	526-548
9	560-601	602-642		578-602	633-652	549-595
10	602-827	643-826		603-823	653-847	596-836
Age: 10						
DECILE						
1	316-448	311-442		326-453	335-484	338-440
2	449-454	443-468		454-478	485-512	441-465
3	455-473	469-493		479-502	513-539	466-490
4	474-496	494-513		503-524	540-568	491-507
5	497-517	514-547		525-541	569-584	508-523
6	518-556	548-587		542-552	585-621	524-539
7	557-575	588-606		553-570	622-645	540-557
8	576-591	607-640		571-604	646-660	558-575
9	592-628	641-675		605-630	661-673	576-618
10	629-827	676-826		631-823	674-847	619-836

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 11						
DECILE						
1	316-463	311-470	453-579	326-472	335-509	338-458
2	464-485	471-518	580-593	473-501	510-551	459-471
3	486-505	519-540	594-607	502-526	552-577	472-497
4	506-521	541-561	608-613	527-551	578-593	498-518
5	522-536	562-586	614-625	552-568	594-608	519-532
6	537-561	587-602	626-632	569-585	609-627	533-547
7	562-576	603-627	633-636	586-601	628-650	548-563
8	577-598	628-651	637-642	602-615	651-660	564-581
9	599-636	652-676	643-651	616-639	661-688	582-611
10	637-827	677-826	652-822	640-823	689-847	612-836
Age: 12						
DECILE						
1	316-469	311-480	453-580	326-505	335-539	338-487
2	470-494	481-523	581-599	506-525	540-580	488-516
3	495-518	524-553	600-605	526-547	581-592	517-533
4	519-540	554-579	606-609	548-572	593-614	534-552
5	541-555	580-604	610-618	573-588	615-635	553-567
6	556-578	605-623	619-622	589-605	636-653	568-578
7	579-597	624-645	623-630	606-618	654-666	579-593
8	598-614	646-659	631-646	619-628	667-683	594-612
9	615-638	660-681	647-659	629-649	684-703	613-625
10	639-827	682-826	660-822	650-823	704-847	626-836
Age: 13						
DECILE						
1	316-474	311-504	453-592	326-498	335-545	338-503
2	475-496	505-550	593-602	499-534	546-577	504-525
3	497-526	551-578	603-609	535-561	578-600	526-547
4	527-555	579-601	610-615	562-578	601-631	548-563
5	556-571	602-624	616-625	579-595	632-649	564-569
6	572-591	625-645	626-631	596-615	650-657	570-589
7	592-608	646-653	632-638	616-628	658-674	590-612
8	609-623	654-684	639-647	629-649	675-698	613-627
9	624-642	685-717	648-660	650-667	699-722	628-646
10	643-827	718-826	661-822	668-823	723-847	647-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students residing in the Northeastern Region

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 14						
DECILE						
1	316-482	311-511	453-584	326-526	335-567	338-515
2	483-517	512-551	585-595	527-554	568-596	516-538
3	518-539	552-593	596-606	555-570	597-628	539-548
4	540-566	594-607	607-618	571-583	629-644	549-566
5	567-580	608-628	619-627	584-608	645-657	567-580
6	581-591	629-651	628-638	609-623	658-667	581-604
7	592-617	652-661	639-650	624-640	668-686	605-643
8	618-634	662-677	651-660	641-668	687-705	644-669
9	635-658	678-708	661-678	669-696	706-731	670-691
10	659-827	709-826	679-822	697-823	732-847	692-836
Age: 15						
DECILE						
1	316-515	311-551	453-582	326-541	335-602	338-525
2	516-540	552-601	583-599	542-569	603-617	526-549
3	541-559	602-622	600-606	570-595	618-631	550-565
4	560-577	623-645	607-620	596-612	632-654	566-586
5	578-594	646-653	621-631	613-627	655-670	587-601
6	595-612	654-673	632-640	628-641	671-680	602-627
7	613-629	674-682	641-651	642-663	681-695	628-654
8	630-640	683-699	652-663	664-680	696-713	655-672
9	641-671	700-711	664-683	681-701	714-732	673-694
10	672-827	712-826	684-822	702-823	733-847	695-836
Age: 16						
DECILE						
1	316-504	311-552	453-602	326-533	335-567	338-535
2	505-557	553-618	603-613	534-588	568-636	536-573
3	558-588	619-647	614-621	589-614	637-652	574-591
4	589-606	648-659	622-630	615-629	653-670	592-607
5	607-618	660-673	631-638	630-647	671-686	608-625
6	619-628	674-680	639-648	648-660	687-696	626-643
7	629-638	681-694	649-659	661-679	697-707	644-659
8	639-646	695-710	660-665	680-694	708-721	660-675
9	647-676	711-726	666-684	695-709	722-745	676-685
10	677-827	727-826	685-822	710-823	746-847	686-836

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age:17						
DECILE						
1	316-500	311-560	453-595	326-557	335-600	338-528
2	501-551	561-599	596-604	558-589	601-639	529-562
3	552-577	600-632	605-615	590-614	640-658	563-593
4	578-597	633-646	616-621	615-633	659-672	594-613
5	598-609	647-663	622-627	634-652	673-683	614-627
6	610-625	664-675	628-637	653-665	684-693	628-641
7	626-642	676-693	638-648	666-679	694-700	642-661
8	643-653	694-711	649-672	680-695	701-711	662-684
9	654-685	712-744	673-683	696-712	712-733	685-702
10	686-827	745-826	684-822	713-823	734-847	703-836
Age: 18						
DECILE						
1	316-500	311-554	453-587	326-530	335-586	338-514
2	501-540	555-617	588-597	531-570	587-628	515-544
3	541-566	618-646	598-606	571-591	629-651	545-564
4	567-579	647-657	607-615	592-612	652-662	565-579
5	580-595	658-666	616-626	613-627	663-675	580-596
6	596-608	667-675	627-634	628-640	676-688	597-612
7	609-624	676-692	635-645	641-660	689-700	613-635
8	625-642	693-713	646-657	661-679	701-717	636-659
9	643-661	714-736	658-670	680-701	718-738	660-691
10	662-827	737-826	671-822	702-823	739-847	692-836

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Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students residing in the Midwestern Region

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age:8						
DECILE						
1	316-442	311-435		326-459	335-457	338-455
2	443-454	436-459		460-469	458-497	456-466
3	455-470	460-476		470-485	498-529	467-480
4	471-493	477-501		486-491	530-538	481-491
5	494-499	502-520		492-505	539-551	492-501
6	500-518	521-535		506-517	552-567	502-509
7	519-537	536-557		518-531	568-581	510-514
8	538-549	558-580		532-545	582-590	515-526
9	550-581	581-607		546-577	591-650	527-555
10	582-827	608-826		578-823	651-847	556-836
Age: 9						
DECILE						
1	316-455	311-454		326-454	335-452	338-449
2	456-468	455-476		455-473	453-504	450-466
3	469-485	477-500		474-494	505-525	467-480
4	486-493	501-522		495-509	526-550	481-489
5	494-507	523-550		510-524	551-567	490-499
6	508-526	551-568		525-534	568-581	500-514
7	527-555	569-593		535-562	582-590	515-527
8	556-570	594-610		563-580	591-614	528-546
9	571-609	611-642		581-603	615-650	547-569
10	610-827	643-826		604-823	651-847	570-836
Age: 10						
DECILE						
1	316-453	311-461		326-471	335-493	338-469
2	454-477	462-497		472-491	494-526	470-489
3	478-489	498-519		492-516	527-543	490-502
4	490-507	520-544		517-532	544-559	503-520
5	508-532	545-568		533-555	560-575	521-531
6	533-552	569-589		556-567	576-592	532-544
7	553-571	590-613		568-581	593-618	545-565
8	572-594	614-649		582-602	619-635	566-579
9	595-630	650-672		603-630	636-669	580-601
10	631-827	673-826		631-823	670-847	602-836

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 11						
DECILE						
1	316-469	311-492	453-591	326-479	335-536	338-474
2	470-496	493-521	592-604	480-525	537-551	475-496
3	497-511	522-562	605-608	526-544	552-578	497-520
4	512-530	563-584	609-612	545-560	579-604	521-549
5	531-550	585-602	613-618	561-579	605-622	550-556
6	551-568	603-626	619-627	580-588	623-632	557-567
7	569-592	627-637	628-632	589-606	633-646	568-582
8	593-612	638-654	633-635	607-619	647-665	583-603
9	613-628	655-688	636-658	620-636	666-687	604-627
10	629-827	689-826	659-822	637-823	688-847	628-836
Age: 12						
DECILE						
1	316-487	311-505	453-570	326-506	335-531	338-475
2	488-510	506-534	571-582	507-524	532-555	476-507
3	511-524	535-559	583-603	525-548	556-583	508-524
4	525-538	560-583	604-610	549-561	584-622	525-538
5	539-555	584-601	611-614	562-578	623-639	539-547
6	556-577	602-621	615-621	579-590	640-654	548-562
7	578-596	622-645	622-631	591-609	655-669	563-584
8	597-608	646-660	632-642	610-635	670-678	585-602
9	609-630	661-678	643-649	636-654	679-697	603-630
10	631-827	679-826	650-822	655-823	698-847	631-836
Age: 13						
DECILE						
1	316-481	311-522	453-589	326-519	335-552	338-482
2	482-527	523-577	590-602	520-550	553-588	483-511
3	528-549	578-601	603-607	551-571	589-616	512-532
4	550-565	602-620	608-614	572-593	617-630	533-552
5	566-581	621-635	615-621	594-606	631-648	553-558
6	582-596	636-652	622-628	607-621	649-663	559-579
7	597-614	653-664	629-638	622-641	664-680	580-590
8	615-638	665-677	639-645	642-655	681-692	591-605
9	639-656	678-706	646-660	656-680	693-710	606-637
10	657-827	707-826	661-822	681-823	711-847	638-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students residing in the Midwestern Region

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 14						
DECILE						
1	316-493	311-543	453-591	326-541	335-568	338-511
2	494-535	544-584	592-602	542-578	569-622	512-521
3	536-559	585-608	603-610	579-593	623-645	522-533
4	560-575	609-628	611-618	594-608	646-660	534-561
5	576-597	629-641	619-622	609-620	661-673	562-571
6	598-608	642-662	623-629	621-640	674-687	572-597
7	609-623	663-674	630-638	641-654	688-695	598-617
8	624-644	675-688	639-648	655-664	696-707	618-629
9	645-661	689-715	649-663	665-686	708-726	630-664
10	662-827	716-826	664-822	687-823	727-847	665-836
Age: 15						
DECILE						
1	316-500	311-529	453-586	326-546	335-571	338-510
2	501-538	530-596	587-603	547-557	572-619	511-545
3	539-564	597-610	604-610	558-586	620-642	546-569
4	565-581	611-634	611-620	587-612	643-659	570-578
5	582-595	635-652	621-625	613-627	660-671	579-600
6	596-610	653-666	626-634	628-638	672-681	601-617
7	611-630	667-676	635-648	639-656	682-697	618-640
8	631-649	677-693	649-664	657-677	698-709	641-661
9	650-664	694-718	665-676	678-694	710-727	662-694
10	665-827	719-826	677-822	695-823	728-847	695-836
Age: 16						
DECILE						
1	316-497	311-532	453-594	326-541	335-575	338-498
2	498-545	533-587	595-603	542-569	576-617	499-540
3	546-560	588-618	604-616	570-591	618-631	541-576
4	561-575	619-641	617-621	592-616	632-660	577-598
5	576-591	642-652	622-630	617-630	661-672	599-615
6	592-611	653-666	631-636	631-651	673-686	616-638
7	612-630	667-678	637-645	652-664	687-701	639-648
8	631-646	679-691	646-650	665-679	702-713	649-668
9	647-671	692-712	651-668	680-697	714-738	669-684
10	672-827	713-826	669-822	698-823	739-847	685-836
Age: 17						
DECILE						
1	316-492	311-551	453-581	326-531	335-587	338-510
2	493-528	552-595	582-600	532-571	588-622	511-544
3	529-555	596-621	601-609	572-593	623-643	545-561
4	556-577	622-643	610-616	594-612	644-658	562-583
5	578-591	644-660	617-624	613-626	659-670	584-600
6	592-605	661-674	625-630	627-639	671-680	601-632
7	606-624	675-690	631-640	640-660	681-690	633-646
8	625-643	691-702	641-658	661-673	691-709	647-665
9	644-663	703-721	659-674	674-702	710-728	666-685
10	664-827	722-826	675-822	703-823	729-847	686-836
Age: 18						
DECILE						
1	316-500	311-574	453-585	326-536	335-578	338-492
2	501-538	575-602	586-598	537-567	579-628	493-519
3	539-565	603-628	599-608	568-588	629-651	520-549
4	566-581	629-645	609-618	589-612	652-665	550-594
5	582-594	646-663	619-628	613-628	666-675	595-610
6	595-610	664-677	629-638	629-641	676-686	611-631
7	611-628	678-693	639-646	642-657	687-697	632-658
8	629-646	694-714	647-660	658-675	698-708	659-678
9	647-668	715-737	661-678	676-695	709-728	679-703
10	669-827	738-826	679-822	696-823	729-847	704-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students residing in the Southern Region

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 8						
DECILE						
1	316-437	311-436		326-435	335-449	338-430
2	438-454	437-455		436-460	450-475	431-445
3	455-464	456-474		461-468	476-494	446-457
4	465-482	475-487		469-477	495-513	458-472
5	483-493	488-505		478-486	514-527	473-485
6	494-512	506-521		487-504	528-540	486-499
7	513-531	522-550		505-524	541-567	500-516
8	532-543	551-568		525-542	568-585	517-528
9	544-592	569-602		543-572	586-613	529-546
10	593-827	603-826		573-823	614-847	547-836
Age: 9						
DECILE						
1	316-431	311-437		326-453	335-482	338-451
2	432-460	438-466		454-469	483-517	452-463
3	461-474	467-489		470-486	518-539	464-471
4	475-487	490-509		487-513	540-551	472-485
5	488-506	510-533		514-525	552-567	486-495
6	507-523	534-556		526-540	568-572	496-516
7	524-550	557-582		541-552	573-588	517-527
8	551-572	583-603		553-570	589-612	528-545
9	573-593	604-636		571-593	613-643	546-566
10	594-827	637-826		594-823	644-847	567-836
Age: 10						
DECILE						
1	316-461	311-469		326-469	335-494	338-457
2	462-488	470-510		470-492	495-530	458-475
3	489-500	511-530		493-507	531-556	476-489
4	501-517	531-550		508-523	557-568	490-504
5	518-539	551-572		524-537	569-588	505-522
6	540-555	573-597		538-556	589-613	523-530
7	556-565	598-612		557-575	614-634	531-538
8	566-582	613-642		576-597	635-649	539-550
9	583-609	643-669		598-613	650-660	551-577
10	610-827	670-826		614-823	661-847	578-836

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 11						
DECILE						
1	316-460	311-469	453-568	326-477	335-527	338-464
2	461-478	470-508	569-580	478-503	528-546	465-487
3	479-494	509-521	581-590	504-523	547-566	488-503
4	495-509	522-557	591-607	524-537	567-582	504-512
5	510-533	558-577	608-613	538-550	583-597	513-526
6	534-554	578-593	614-622	551-565	598-612	527-541
7	555-571	594-616	623-628	566-581	613-629	542-561
8	572-590	617-636	629-634	582-604	630-642	562-580
9	591-618	637-671	635-656	605-622	643-669	581-610
10	619-827	672-826	657-822	623-823	670-847	611-836
Age: 13						
DECILE						
1	316-466	311-478	453-582	326-470	335-517	338-456
2	467-478	479-513	583-589	471-497	518-550	457-477
3	479-498	514-537	590-598	498-518	551-565	478-492
4	499-518	538-572	599-603	519-540	566-586	493-512
5	519-543	573-596	604-615	541-555	587-602	513-527
6	544-556	597-605	616-620	556-570	603-618	528-549
7	557-576	606-637	621-627	571-586	619-636	550-564
8	577-597	638-662	628-636	587-605	637-654	565-575
9	598-620	663-691	637-656	606-629	655-680	576-599
10	621-827	692-826	657-822	630-823	681-847	600-836
Age: 13						
DECILE						
1	316-479	311-511	453-568	326-506	335-550	338-483
2	480-505	512-531	569-584	507-525	551-580	484-512
3	506-528	532-569	585-594	526-543	581-602	513-530
4	529-544	570-589	595-606	544-566	603-617	531-543
5	545-564	590-606	607-613	567-582	618-632	544-553
6	565-579	607-625	614-626	583-595	633-642	554-563
7	580-594	626-646	627-634	596-612	643-655	564-575
8	595-611	647-674	635-643	613-633	656-673	576-608
9	612-641	675-696	644-663	634-661	674-691	609-643
10	642-827	697-826	664-822	662-823	692-847	644-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students residing in the Southern Region

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 14						
DECILE						
1	316-478	311-510	453-570	326-513	335-565	338-485
2	479-510	511-546	571-592	514-540	566-594	486-526
3	511-535	547-579	593-603	541-554	595-610	527-537
4	536-552	580-610	604-610	555-577	611-623	538-553
5	553-571	611-631	611-619	578-591	624-639	554-563
6	572-586	632-649	620-630	592-604	640-654	564-576
7	587-599	650-660	631-639	605-620	655-668	577-589
8	600-619	661-675	640-644	621-648	669-688	590-620
9	620-647	676-704	645-659	649-682	689-710	621-648
10	648-827	705-826	660-822	683-823	711-847	649-836
Age: 15						
DECILE						
1	316-490	311-514	453-578	326-524	335-567	338-488
2	491-524	515-577	579-591	525-555	568-607	489-519
3	525-553	578-605	592-603	556-577	608-635	520-540
4	554-566	606-626	604-611	578-594	636-645	541-559
5	567-583	627-642	612-621	595-613	646-663	560-576
6	584-601	643-659	622-629	614-627	664-672	577-593
7	602-622	660-674	630-641	628-642	673-686	594-617
8	623-642	675-691	642-653	643-666	687-697	618-634
9	643-669	692-714	654-679	667-694	698-717	635-665
10	670-827	715-826	680-822	695-823	718-847	666-836
Age: 16						
DECILE						
1	316-495	311-550	453-583	326-537	335-579	338-494
2	496-530	551-594	584-598	538-565	580-620	495-537
3	531-549	595-622	599-606	566-583	621-643	538-552
4	550-573	623-635	607-617	584-602	644-655	553-561
5	574-590	636-650	618-621	603-623	656-670	562-578
6	591-601	651-664	622-629	624-638	671-680	579-607
7	602-617	665-675	630-638	639-653	681-689	608-630
8	618-635	676-693	639-651	654-663	690-698	631-648
9	636-662	694-720	652-681	664-686	699-719	649-678
10	663-827	721-826	682-822	687-823	720-847	679-836

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 17						
DECILE						
1	316-494	311-550	453-584	326-530	335-577	338-501
2	495-526	551-601	585-601	531-567	578-616	502-540
3	527-555	602-624	602-614	568-594	617-645	541-555
4	556-569	625-649	615-620	595-611	646-666	556-575
5	570-588	650-663	621-631	612-624	667-673	576-588
6	589-610	664-674	632-639	625-649	674-684	589-606
7	611-627	675-686	640-647	650-661	685-699	607-626
8	628-641	687-700	648-657	662-681	700-716	627-653
9	642-660	701-725	658-673	682-706	717-738	654-671
10	661-827	726-826	674-822	707-823	739-847	672-836
Age: 18						
DECILE						
1	316-494	311-551	453-580	326-523	335-573	338-501
2	495-522	552-595	581-593	524-555	574-614	502-524
3	523-548	596-618	594-602	556-577	615-639	525-543
4	549-565	619-643	603-609	578-593	640-654	544-557
5	566-578	644-655	610-617	594-613	655-665	558-575
6	579-591	656-673	618-622	614-631	666-674	576-591
7	592-603	674-683	623-631	632-650	675-688	592-612
8	604-624	684-695	632-642	651-664	689-698	613-636
9	625-647	696-717	643-654	665-686	699-719	637-661
10	648-827	718-826	655-822	687-823	720-847	662-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students residing in the Western Region

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 8						
DECILE						
1	316-437					
2	438-449					
3	450-455					
4	456-464					
5	465-475					
6	476-493					
7	494-504					
8	505-548					
9	549-574					
10	575-827					
Age: 9						
DECILE						
1	316-429	311-432		326-444	335-443	
2	430-448	433-453		445-466	444-469	
3	449-457	454-472		467-476	470-506	
4	458-471	473-489		477-479	507-525	
5	472-481	490-516		480-489	526-549	
6	482-505	517-562		490-527	550-557	
7	506-551	563-591		528-561	558-581	
8	552-563	592-615		562-587	582-622	
9	564-605	616-651		588-633	623-653	
10	606-827	652-826		634-823	654-847	
Age: 10						
DECILE						
1	316-444	311-467		326-468	335-503	
2	445-463	468-492		469-489	504-542	
3	464-482	493-521		490-514	543-551	
4	483-503	522-545		515-529	552-572	
5	504-520	546-550		530-542	573-583	
6	521-536	551-569		543-554	584-593	
7	537-546	570-600		555-574	594-607	
8	547-568	601-605		575-600	608-626	
9	569-596	606-637		601-628	627-658	
10	597-827	638-826		629-823	659-847	

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 11						
DECILE						
1	316-451	311-476		326-460	335-479	338-460
2	452-466	477-516		461-481	480-526	461-471
3	467-487	517-551		482-498	527-567	472-484
4	488-512	552-579		499-531	568-575	485-499
5	513-549	580-589		532-557	576-595	500-509
6	550-575	590-618		558-575	596-629	510-540
7	576-588	619-644		576-595	630-643	541-551
8	589-607	645-660		596-610	644-661	552-579
9	608-630	661-675		611-635	662-671	580-613
10	631-827	676-826		636-823	672-847	614-836
Age: 12						
DECILE						
1	316-465	311-521		326-495	335-540	338-485
2	466-483	522-549		496-530	541-567	486-507
3	484-515	550-583		531-548	568-591	508-517
4	516-529	584-597		549-568	592-611	518-535
5	530-544	598-617		569-580	612-632	536-554
6	545-571	618-629		581-587	633-642	555-569
7	572-583	630-642		588-606	643-653	570-585
8	584-599	643-652		607-620	654-664	586-594
9	600-621	653-675		621-639	665-691	595-644
10	622-827	676-826		640-823	692-847	645-836
Age: 13						
DECILE						
1	316-461	311-506	453-592	326-496	335-519	338-470
2	462-498	507-550	593-599	497-524	520-572	471-509
3	499-527	551-583	600-603	525-550	573-597	510-528
4	528-548	584-600	604-616	551-575	598-611	529-555
5	549-567	601-611	617-620	576-594	612-636	556-567
6	568-578	612-639	621-627	595-607	637-654	568-584
7	579-593	640-656	628-636	608-619	655-674	585-595
8	594-612	657-674	637-646	620-638	675-689	596-626
9	613-645	675-692	647-662	639-680	690-709	627-652
10	646-827	693-826	663-822	681-823	710-847	653-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students residing in the Western Region

Age: 14

DECILE	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
1	316-485	311-529	453-581	326-524	335-566	338-519
2	486-518	530-577	582-600	525-554	567-596	520-543
3	519-542	578-605	601-609	555-576	597-619	544-558
4	543-565	606-626	610-616	577-592	620-639	559-572
5	566-576	627-639	617-621	593-613	640-659	573-597
6	577-597	640-659	622-629	614-627	660-667	598-608
7	598-614	660-676	630-635	628-646	668-677	609-624
8	615-625	677-698	636-654	647-651	678-698	625-639
9	626-662	699-724	655-670	652-670	699-723	640-667
10	663-827	725-826	671-822	671-823	724-847	668-836

Age: 15

DECILE	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
1	316-473	311-520	453-579	326-501	335-566	338-509
2	474-517	521-579	580-593	502-555	567-616	510-531
3	518-548	580-601	594-605	556-576	617-639	532-557
4	549-569	602-617	606-616	577-593	640-653	558-578
5	570-590	618-644	617-623	594-611	654-664	579-596
6	591-605	645-663	624-629	612-629	665-674	597-616
7	606-615	664-679	630-642	630-644	675-684	617-628
8	616-628	680-698	643-648	645-666	685-701	629-650
9	629-657	699-722	649-670	667-694	702-725	651-676
10	658-827	723-826	671-822	695-823	726-847	677-836

Age: 16

DECILE	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
1	316-464	311-547	453-593	326-520	335-542	338-482
2	465-513	548-586	594-601	521-559	543-610	483-523
3	514-532	587-612	602-610	560-582	611-642	524-546
4	533-559	613-629	611-614	583-602	643-659	547-564
5	560-585	630-652	615-629	603-621	660-671	565-590
6	586-602	653-670	630-635	622-632	672-687	591-614
7	603-619	671-675	636-646	633-656	688-697	615-634
8	620-638	676-694	647-659	657-686	698-710	635-668
9	639-659	695-710	660-685	687-712	711-730	669-696
10	660-827	711-826	686-822	713-823	731-847	697-836

Age: 17

DECILE	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
1	316-477	311-575	453-591	326-529	335-569	338-510
2	478-526	576-605	592-600	530-560	570-623	511-537
3	527-551	606-634	601-605	561-583	624-640	538-561
4	552-567	635-652	606-613	584-606	641-659	562-583
5	568-589	653-665	614-620	607-619	660-669	584-598
6	590-606	666-675	621-631	620-637	670-680	599-614
7	607-622	676-684	632-639	638-651	681-688	615-636
8	623-633	685-710	640-651	652-664	689-707	637-657
9	634-653	711-724	652-667	665-684	708-725	658-676
10	654-827	725-826	668-822	685-823	726-847	677-836

Age: 18

DECILE	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
1	316-489	311-550	453-579	326-531	335-570	338-524
2	490-508	551-601	580-598	532-552	571-622	525-548
3	509-543	602-622	599-603	553-586	623-645	549-562
4	544-564	623-647	604-614	587-609	646-662	563-577
5	565-578	648-661	615-620	610-628	663-670	578-595
6	579-594	662-675	621-627	629-638	671-679	596-613
7	595-608	676-688	628-634	639-653	680-688	614-639
8	609-626	689-699	635-642	654-662	689-700	640-652
9	627-645	700-736	643-651	663-683	701-719	653-675
10	646-827	737-826	652-822	684-823	720-847	676-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students attending RESIDENTIAL schools

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 8						
DECILE						
1	316-436	311-430		326-446	335-432	338-436
2	437-449	431-449		447-465	433-456	437-460
3	450-459	450-463		466-470	457-478	461-472
4	460-472	464-486		471-479	479-509	473-479
5	473-490	487-510		480-487	510-520	480-491
6	491-499	511-525		488-497	521-536	492-498
7	500-513	526-550		498-516	537-551	499-509
8	514-535	551-566		517-524	552-569	510-515
9	536-576	567-593		525-545	570-607	516-537
10	577-827	594-826		546-823	608-847	538-836
Age: 9						
DECILE						
1	316-453	311-451		326-447	335-445	338-447
2	454-467	452-477		448-465	446-485	448-461
3	468-476	478-498		466-475	486-513	462-469
4	477-487	499-511		476-484	514-537	470-478
5	488-496	512-529		485-505	538-552	479-495
6	497-507	530-550		506-519	553-567	496-513
7	508-528	551-576		520-533	568-586	514-526
8	529-556	577-600		534-562	587-606	527-545
9	557-590	601-635		563-594	607-651	546-569
10	591-827	636-826		595-823	652-847	570-836
Age: 10						
DECILE						
1	316-455	311-456		326-465	335-497	338-454
2	456-477	457-501		466-489	498-526	455-475
3	478-487	502-529		490-507	527-542	476-490
4	488-508	530-550		508-520	543-557	491-504
5	509-530	551-568		521-536	558-575	505-522
6	531-547	569-586		537-556	576-588	523-530
7	548-556	587-602		557-570	589-621	531-543
8	557-572	603-642		571-582	622-642	544-557
9	573-600	643-663		583-605	643-665	558-581
10	601-827	664-826		606-823	666-847	582-836

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 11						
DECILE						
1	316-462	311-482	453-574	326-465	335-521	338-457
2	463-481	483-517	575-588	466-487	522-542	458-474
3	482-499	518-544	589-598	488-519	543-562	475-489
4	500-511	545-567	599-607	520-533	563-581	490-503
5	512-532	568-583	608-611	534-551	582-597	504-517
6	533-554	584-601	612-615	552-568	598-609	518-541
7	555-571	602-622	616-623	569-583	610-631	542-552
8	572-586	623-643	624-629	584-599	632-652	553-574
9	587-611	644-669	630-634	600-619	653-670	575-608
10	612-827	670-826	635-822	620-823	671-847	609-836
Age: 12						
DECILE						
1	316-471	311-492	453-568	326-492	335-534	338-471
2	472-490	493-530	569-579	493-516	535-554	472-491
3	491-512	531-564	580-588	517-532	555-578	492-510
4	513-532	565-584	589-601	533-552	579-599	511-525
5	533-547	585-601	602-609	553-569	600-618	526-547
6	548-557	602-619	610-617	570-580	619-637	548-562
7	558-576	620-640	618-621	581-598	638-654	563-570
8	577-595	641-655	622-631	599-626	655-671	571-587
9	596-614	656-672	632-648	627-646	672-692	588-617
10	615-827	673-826	649-822	647-823	693-847	618-836
Age: 13						
DECILE						
1	316-479	311-512	453-577	326-505	335-550	338-483
2	480-503	513-550	578-588	506-526	551-579	484-516
3	504-533	551-580	589-601	527-550	580-599	517-534
4	534-548	581-600	602-605	551-571	600-619	535-543
5	549-560	601-611	606-611	572-584	620-635	544-559
6	561-577	612-635	612-620	585-598	636-648	560-565
7	578-594	636-652	621-627	599-617	649-661	566-578
8	595-609	653-664	628-634	618-635	662-680	579-600
9	610-639	665-690	635-647	636-660	681-700	601-637
10	640-827	691-826	648-822	661-823	701-847	638-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students attending RESIDENTIAL schools

Age: 14

DECILE	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Caputatn	Math Applicatns
1	316-484	311-523	453-585	326-524	335-573	338-514
2	485-519	524-558	586-602	525-554	574-607	515-529
3	520-544	559-602	603-611	555-573	608-626	530-543
4	545-566	603-627	612-618	574-591	627-644	544-560
5	567-583	628-637	619-624	592-607	645-659	561-569
6	584-599	638-654	625-632	608-621	660-672	570-585
7	600-614	655-672	633-638	622-643	673-686	586-609
8	615-632	673-686	639-650	644-662	687-701	610-644
9	633-659	687-711	651-664	663-687	702-720	645-678
10	660-827	712-826	665-822	688-823	721-847	679-836

Age: 15

DECILE	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Caputatn	Math Applicatns
1	316-495	311-534	453-579	326-533	335-570	338-507
2	496-537	535-596	580-592	534-559	571-617	508-534
3	538-560	597-613	593-603	560-583	618-639	535-558
4	561-575	614-635	604-610	584-600	640-654	559-577
5	576-587	636-652	611-620	601-615	655-665	578-587
6	588-601	653-663	621-628	616-629	666-673	588-604
7	602-617	664-675	629-639	630-647	674-688	605-630
8	618-639	676-694	640-649	648-666	689-706	631-648
9	640-658	695-714	650-670	667-685	707-725	649-670
10	659-827	715-826	671-822	686-823	726-847	671-836

Age: 16

DECILE	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Caputatn	Math Applicatns
1	316-491	311-540	453-591	326-532	335-570	338-497
2	492-536	541-596	592-603	533-565	571-615	498-536
3	537-557	597-621	604-614	566-589	616-640	537-554
4	558-576	622-641	615-620	590-613	641-657	555-577
5	577-596	642-654	621-628	614-628	658-671	578-597
6	597-611	655-672	629-636	629-640	672-684	598-619
7	612-626	673-679	637-643	641-656	685-695	620-640
8	627-637	680-692	644-651	657-672	696-708	641-659
9	638-656	693-712	652-668	673-695	709-726	660-679
10	657-827	713-826	669-822	696-823	727-847	680-836

Age: 17

DECILE	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Caputatn	Math Applicatns
1	316-505	311-568	453-584	326-541	335-589	338-514
2	506-538	569-602	585-599	542-574	590-630	515-543
3	539-560	603-631	600-608	575-599	631-651	544-566
4	561-578	632-652	609-616	600-613	652-666	567-584
5	579-594	653-665	617-624	614-629	667-674	585-600
6	595-608	666-674	625-632	630-649	675-684	601-619
7	609-625	675-685	633-640	650-661	685-697	620-634
8	626-640	686-701	641-652	662-679	698-715	635-655
9	641-657	702-721	653-668	680-703	716-735	656-677
10	658-827	722-826	669-822	704-823	736-847	678-836

Age: 18

DECILE	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Caputatn	Math Applicatns
1	316-498	311-555	453-583	326-533	335-582	338-503
2	499-533	556-601	584-594	534-561	583-624	504-528
3	534-553	602-628	595-602	562-585	625-649	529-545
4	554-569	629-649	603-609	586-605	650-661	546-559
5	570-582	650-663	610-618	606-621	662-671	560-575
6	583-595	664-674	619-625	622-634	672-679	576-592
7	596-608	675-687	626-634	635-651	680-689	593-614
8	609-628	688-696	635-645	652-666	690-706	615-637
9	629-648	697-720	646-662	667-690	707-727	638-661
10	649-827	721-826	663-822	691-823	728-847	662-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spr ng, 1983

Subgroup: Students attending DAY schools

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 8						
DECILE						
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
Age: 9						
DECILE						
1	316-422	311-437		326-443	335-430	338-413
2	423-438	438-456		444-459	431-464	414-448
3	439-455	457-469		460-475	465-494	449-455
4	456-463	470-489		476-484	495-511	456-466
5	464-480	490-519		485-511	512-526	467-480
6	481-492	520-533		512-522	527-550	481-500
7	493-518	534-552		523-529	551-564	501-513
8	519-534	553-589		530-539	565-587	514-518
9	535-576	590-611		540-562	588-642	519-532
10	577-827	612-826		563-823	643-847	533-836
Age: 10						
DECILE						
1	316-425			326-444	335-483	
2	426-442			445-454	484-505	
3	443-451			455-476	506-520	
4	452-457			477-497	521-541	
5	458-487			498-512	542-557	
6	488-495			513-536	558-569	
7	496-517			537-552	570-612	
8	518-582			553-576	613-627	
9	583-619			577-634	628-659	
10	620-827			635-823	660-847	

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 11						
DECILE						
1	316-449	311-457		326-463	335-456	
2	450-459	458-490		464-478	457-506	
3	460-469	491-512		479-495	507-537	
4	470-480	513-531		496-523	538-560	
5	481-499	532-550		524-543	561-583	
6	500-515	551-579		544-555	584-602	
7	516-535	580-601		556-570	603-618	
8	536-555	602-620		571-583	619-635	
9	556-580	621-653		584-610	636-660	
10	581-827	654-826		611-823	661-847	
Age: 12						
DECILE						
1	316-449	311-454		326-465	335-503	338-464
2	450-460	455-489		466-507	504-532	465-482
3	461-479	490-512		508-520	533-564	483-499
4	480-490	513-533		521-535	565-586	500-514
5	491-511	534-551		536-550	587-596	515-518
6	512-523	552-581		551-566	597-610	519-533
7	524-544	582-601		567-580	611-635	534-553
8	545-569	602-631		581-594	636-652	554-564
9	570-611	632-652		595-624	653-679	565-597
10	612-827	653-826		625-823	680-847	598-836
Age: 13						
DECILE						
1	316-460	311-481		326-482	335-501	338-461
2	461-468	482-516		483-513	502-542	462-493
3	469-489	517-533		514-533	543-567	494-510
4	490-503	534-576		534-550	568-582	511-516
5	504-528	577-596		551-570	583-604	517-528
6	529-556	597-612		571-581	605-621	529-546
7	557-578	613-637		582-595	622-645	547-564
8	579-597	638-653		596-616	646-660	565-584
9	598-618	654-687		617-650	661-707	585-614
10	619-827	688-826		651-823	708-847	615-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students attending DAY schools

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Computatn	Math Applicatns
Age: 14						
DECILE						
1	316-458	311-497		326-492	335-538	338-478
2	459-481	498-512		493-530	539-567	479-491
3	482-496	513-553		531-551	568-581	492-514
4	497-523	554-580		552-572	582-602	515-526
5	524-542	581-604		573-587	603-624	527-543
6	543-570	605-624		588-599	625-641	544-563
7	571-581	625-643		600-614	642-657	564-591
8	582-599	644-652		615-634	658-679	592-608
9	600-620	653-675		635-650	680-693	609-638
10	621-827	676-826		651-823	694-847	639-836
Age: 15						
DECILE						
1	316-471	311-523		326-511	335-566	
2	472-494	524-551		512-548	567-598	
3	495-505	552-601		549-556	599-614	
4	506-538	602-611		557-580	615-626	
5	539-556	612-633		581-592	627-640	
6	557-579	634-646		593-615	641-654	
7	580-593	647-666		616-631	655-670	
8	594-618	667-690		632-648	671-687	
9	619-637	691-716		649-682	688-715	
10	638-827	717-826		683-823	716-847	
Age: 16						
DECILE						
1	316-454	311-538		326-505	335-516	
2	455-475	539-590		506-540	517-566	
3	476-512	591-610		541-560	567-597	
4	513-526	611-619		561-573	598-631	
5	527-547	620-637		574-593	632-652	
6	548-557	638-645		594-609	653-665	
7	558-580	646-656		610-629	666-674	
8	581-591	657-670		630-639	675-691	
9	592-614	671-681		640-666	692-709	
10	615-827	682-826		667-823	710-847	

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Computatn	Math Applicatns
Age: 17						
DECILE						
1	316-454			326-479	335-515	
2	455-461			480-498	516-540	
3	462-479			499-533	541-588	
4	480-497			534-564	589-610	
5	498-525			565-587	611-640	
6	526-544			588-616	641-655	
7	545-569			617-622	656-677	
8	570-597			623-637	678-688	
9	598-620			638-639	689-706	
10	621-827			640-823	707-847	
Age: 18						
DECILE						
1	316-466	311-550	453-577	326-501	335-542	
2	467-481	551-582	578-595	502-538	543-584	
3	482-505	583-616	596-603	539-563	585-620	
4	506-530	617-635	604-609	564-582	621-640	
5	531-569	636-646	610-612	583-595	641-659	
6	570-583	647-658	613-620	596-622	660-672	
7	584-593	659-675	621-628	623-638	673-683	
8	594-612	676-703	629-638	639-654	684-689	
9	613-627	704-737	639-659	655-675	690-715	
10	628-827	738-826	660-822	676-823	716-847	

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students attending residential OR day schools
(Both types of schools are considered as a single group)

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 8						
DECILE						
1	316-433	311-428		326-443	335-433	338-432
2	434-447	429-444		444-456	434-455	433-448
3	448-455	445-460		457-467	456-470	449-459
4	456-464	461-481		468-473	471-496	460-471
5	465-485	482-504		474-482	497-517	472-480
6	486-494	505-522		483-491	518-530	481-495
7	495-509	523-550		492-509	531-549	496-501
8	510-533	551-566		510-524	550-567	502-516
9	534-569	567-596		525-550	568-603	517-539
10	570-827	597-826		551-823	604-847	540-836
Age: 9						
DECILE						
1	316-442	311-447		326-446	335-442	338-442
2	443-456	448-469		447-464	443-478	443-456
3	457-470	470-488		465-475	479-509	457-466
4	471-480	489-507		476-484	510-524	467-475
5	481-490	508-522		485-506	525-550	476-491
6	491-504	523-544		507-523	551-567	492-509
7	505-524	545-571		524-532	568-579	510-518
8	525-555	572-601		533-555	580-603	519-531
9	556-584	602-632		556-576	604-651	532-555
10	585-827	633-826		577-823	652-847	556-836
Age: 10						
DECILE						
1	316-444	311-446		326-457	335-493	338-438
2	445-457	447-479		458-480	494-517	439-465
3	458-481	480-514		481-498	518-537	466-479
4	482-494	515-532		499-513	538-552	480-492
5	495-514	533-550		514-532	553-569	493-509
6	515-539	551-578		533-550	570-588	510-527
7	540-554	579-601		551-566	589-618	528-538
8	555-574	602-638		567-581	619-643	539-549
9	575-610	639-663		582-608	644-661	550-576
10	611-827	664-826		609-823	662-847	577-836

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 11						
DECILE						
1	316-456	311-468	453-574	326-465	335-503	338-453
2	457-471	469-511	575-586	466-484	504-536	454-466
3	472-487	512-527	587-591	485-512	537-552	467-479
4	488-503	528-556	592-605	513-532	553-579	480-496
5	504-520	557-578	606-609	533-549	580-592	497-509
6	521-537	579-600	610-614	550-565	593-608	510-526
7	538-564	601-611	615-622	566-580	609-625	527-546
8	565-580	612-639	623-629	581-594	626-648	547-565
9	581-609	640-667	630-639	595-619	649-669	566-603
10	610-827	668-826	640-822	620-823	670-847	604-836
Age: 12						
DECILE						
1	316-465	311-484	453-570	326-486	335-525	338-468
2	466-480	485-518	571-584	487-512	526-551	469-490
3	481-500	519-550	585-591	513-531	552-569	491-509
4	501-517	551-576	592-606	532-546	570-590	510-522
5	518-536	577-598	607-610	547-564	591-613	523-539
6	537-550	599-609	611-618	565-576	614-629	540-558
7	551-567	610-631	619-621	577-592	630-651	559-568
8	568-589	632-650	622-632	593-614	652-667	569-586
9	590-614	651-667	633-649	615-639	668-689	587-617
10	615-827	668-826	650-822	640-823	690-847	618-836
Age: 13						
DECILE						
1	316-469	311-510	453-577	326-498	335-534	338-477
2	470-490	511-532	578-590	499-524	535-567	478-509
3	491-517	533-572	591-601	525-542	568-593	510-523
4	518-540	573-594	602-606	543-566	594-609	524-539
5	541-557	595-608	607-612	567-581	610-628	540-553
6	558-572	609-631	613-620	582-594	629-643	554-564
7	573-591	632-647	621-626	595-613	644-659	565-577
8	592-607	648-663	627-634	614-630	660-679	578-597
9	608-635	664-689	635-648	631-658	680-701	598-633
10	636-827	690-826	649-822	659-823	702-847	634-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students attending residential OR day schools
(Both types of schools are considered as a single group)

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Computatn	Math Applicatns
Age: 14						
DECILE						
1	316-477	311-511	453-582	326-519	335-565	338-498
2	478-506	512-551	583-599	520-549	566-593	499-525
3	507-533	552-592	600-607	550-570	594-616	526-538
4	534-556	593-615	608-614	571-584	617-631	539-554
5	557-575	616-632	615-621	585-603	632-651	555-566
6	576-590	633-651	622-628	604-617	652-662	567-580
7	591-604	652-663	629-637	618-635	663-680	581-604
8	605-624	664-676	638-646	636-655	681-692	605-636
9	625-651	677-710	647-663	656-680	693-716	637-671
10	652-827	711-826	664-822	681-823	717-847	672-836
Age: 15						
DECILE						
1	316-494	311-532	453-579	326-532	335-568	338-509
2	495-527	533-595	580-593	533-555	569-612	510-533
3	528-554	596-610	594-603	556-580	613-634	534-555
4	555-571	611-633	604-609	581-596	635-649	556-574
5	572-583	634-650	610-619	597-613	650-663	575-583
6	584-597	651-663	620-626	614-628	664-672	584-597
7	598-615	664-675	627-638	629-642	673-687	598-626
8	616-637	676-693	639-647	643-665	688-702	627-644
9	638-657	694-716	648-670	666-686	703-725	645-668
10	658-827	717-826	671-822	687-823	726-847	669-836
Age: 16						
DECILE						
1	316-481	311-541	453-589	326-527	335-562	338-490
2	482-526	542-597	590-600	528-561	563-611	491-531
3	527-549	598-619	601-610	562-586	612-635	532-551
4	550-570	620-638	611-619	587-605	636-654	552-570
5	571-589	639-652	620-625	606-624	655-669	571-593
6	590-605	653-669	626-633	625-638	670-680	594-614
7	606-621	670-676	634-642	639-654	681-694	615-638
8	622-635	677-692	643-650	655-670	695-707	639-658
9	636-654	693-712	651-668	671-695	708-726	659-679
10	655-827	713-826	669-822	696-823	727-847	680-836

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Computatn	Math Applicatns
Age: 17						
DECILE						
1	316-490	311-551	453-584	326-530	335-576	338-509
2	491-526	552-601	585-599	531-569	577-621	510-537
3	527-554	602-625	600-607	570-594	622-646	538-561
4	555-571	626-646	608-614	595-612	647-663	562-581
5	572-590	647-663	615-621	613-625	664-673	582-596
6	591-605	664-673	622-631	626-642	674-683	597-614
7	606-623	674-683	632-639	643-657	684-695	615-633
8	624-636	684-700	640-651	658-673	696-710	634-654
9	637-656	701-720	652-668	674-700	711-729	655-676
10	657-827	721-826	669-822	701-823	730-847	677-836
Age: 18						
DECILE						
1	316-494	311-555	453-582	326-532	335-573	338-501
2	495-526	556-601	583-594	533-558	574-621	502-525
3	527-549	602-628	595-602	559-584	622-645	526-543
4	550-566	629-649	603-609	585-600	646-660	544-558
5	567-581	650-662	610-618	601-620	661-670	559-574
6	582-594	663-674	619-625	621-634	671-679	575-592
7	595-607	675-685	626-634	635-651	680-688	593-612
8	608-627	686-696	635-644	652-665	689-703	613-636
9	628-647	697-721	645-662	666-689	704-726	637-661
10	648-827	722-826	663-822	690-823	727-847	662-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students attending local schools with hearing students
(Includes BOTH mainstreamed and self-contained classrooms)

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 8						
DECILE						
1	316-439	311-435		326-455	335-463	338-440
2	440-456	436-458		456-469	464-491	441-457
3	457-469	459-476		470-477	492-511	458-472
4	470-491	477-497		478-490	512-533	473-486
5	492-510	498-515		491-512	534-550	487-501
6	511-530	516-540		513-527	551-566	502-514
7	531-545	541-575		528-542	567-582	515-520
8	546-563	576-594		543-562	583-603	521-535
9	564-605	595-621		563-593	604-642	536-557
10	606-827	622-826		594-823	643-847	558-836
Age: 9						
DECILE						
1	316-442	311-441	453-573	326-456	335-496	338-451
2	443-463	442-470	574-588	457-477	497-527	452-471
3	464-482	471-489	589-594	478-497	528-550	472-480
4	483-500	490-529	595-602	498-515	551-565	481-491
5	501-525	530-552	603-613	516-533	566-568	492-502
6	526-546	553-580	614-623	534-554	569-587	503-516
7	547-560	581-598	624-631	555-574	588-601	517-538
8	561-584	599-617	632-638	575-592	602-626	539-558
9	585-614	618-652	639-659	593-616	627-652	559-581
10	615-827	653-826	660-822	617-823	653-847	582-836
Age: 10						
DECILE						
1	316-458	311-464	453-577	326-473	335-495	338-464
2	459-482	465-496	578-595	474-502	496-538	465-489
3	483-499	497-520	596-605	503-518	539-565	490-505
4	500-518	521-548	606-611	519-534	566-582	506-520
5	519-543	549-574	612-618	535-549	583-592	521-533
6	544-563	575-599	619-624	550-571	593-616	534-547
7	564-577	600-612	625-632	572-593	617-636	548-565
8	578-598	613-639	633-641	594-605	637-652	566-580
9	599-630	640-675	642-659	606-635	653-668	581-619
10	631-827	676-826	660-822	636-823	669-847	620-836
Age: 11						
DECILE						
1	316-468	311-475	453-589	326-492	335-531	338-482
2	469-492	476-520	590-604	493-514	532-561	483-502
3	493-519	521-550	605-609	515-541	562-579	503-517
4	520-537	551-579	610-618	542-560	580-603	518-536
5	538-561	580-600	619-625	561-575	604-621	537-551
6	562-578	601-621	626-631	576-593	622-635	552-563
7	579-594	622-639	632-635	594-607	636-650	564-577
8	595-616	640-665	636-645	608-623	651-663	578-597
9	617-638	666-686	646-656	624-646	664-688	598-620
10	639-827	687-826	657-822	647-823	689-847	621-836
Age: 12						
DECILE						
1	316-477	311-507	453-582	326-497	335-537	338-473
2	478-503	508-537	583-596	498-525	538-568	474-508
3	504-529	538-564	597-605	526-552	569-591	509-526
4	530-550	565-594	606-612	553-567	592-616	527-543
5	551-572	595-613	613-618	568-585	617-635	544-562
6	573-589	614-633	619-626	586-598	636-651	563-573
7	590-604	634-652	627-632	599-614	652-660	574-589
8	605-618	653-668	633-644	615-628	661-679	590-607
9	619-640	669-695	645-659	629-655	680-692	608-630
10	641-827	696-826	660-822	656-823	693-847	631-836
Age: 13						
DECILE						
1	316-487	311-527	453-594	326-519	335-553	338-491
2	488-527	528-569	595-601	520-548	554-595	492-526
3	528-549	570-596	602-610	549-573	596-621	527-549
4	550-570	597-611	611-621	574-594	622-638	550-561
5	571-583	612-635	622-630	595-608	639-652	562-575
6	584-600	636-652	631-638	609-621	653-666	576-590
7	601-619	653-672	639-644	622-639	667-684	591-612
8	620-638	673-690	645-658	640-657	685-697	613-633
9	639-658	691-715	659-668	658-681	698-716	634-659
10	659-827	716-826	669-822	682-823	717-847	660-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students attending local schools with hearing students (Includes BOTH mainstreamed and self-contained classrooms)

Age: 14

DECILE	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
1	316-502	311-534	453-583	326-530	335-570	338-521
2	503-536	535-578	584-597	531-557	571-602	522-544
3	537-554	579-602	598-605	558-580	603-629	545-557
4	555-572	603-622	606-616	581-596	630-650	558-571
5	573-586	623-636	617-626	597-614	651-664	572-587
6	587-603	637-656	627-635	615-630	665-672	588-609
7	604-620	657-674	636-646	631-649	673-688	610-624
8	621-640	675-691	647-658	650-664	689-707	625-646
9	641-672	692-717	659-681	665-695	708-727	647-676
10	673-827	718-826	682-822	696-823	728-847	677-836

Age: 15

DECILE	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
1	316-502	311-528	453-589	326-538	335-584	338-516
2	503-541	529-588	590-605	539-560	585-619	517-544
3	542-560	589-610	606-619	561-590	620-643	545-568
4	561-584	611-632	620-625	591-616	644-660	569-588
5	585-606	633-653	626-636	617-631	661-673	589-605
6	607-622	654-670	637-646	632-647	674-683	606-624
7	623-635	671-682	647-658	648-664	684-696	625-654
8	636-656	683-698	659-672	665-685	697-710	655-677
9	657-677	699-721	673-688	686-702	711-735	678-696
10	678-827	722-826	689-822	703-823	736-847	697-836

Age: 16

DECILE	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
1	316-514	311-550	453-592	326-539	335-590	338-518
2	515-545	551-594	593-608	540-574	591-634	519-553
3	546-571	595-622	609-617	575-597	635-651	554-571
4	572-590	623-643	618-623	598-622	652-669	572-594
5	591-604	644-661	624-633	623-635	670-681	595-615
6	605-621	662-674	634-643	636-654	682-688	616-633
7	622-639	675-689	644-652	655-668	689-701	634-653
8	640-656	690-700	653-665	669-692	702-717	654-676
9	657-683	701-725	666-686	693-712	718-737	677-699
10	684-827	726-826	687-822	713-823	738-847	700-836

Age: 17

DECILE	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
1	316-497	311-551	453-596	326-540	335-593	338-533
2	498-540	552-600	597-608	541-571	594-626	534-551
3	541-564	601-632	609-618	572-600	627-645	552-573
4	565-584	633-652	619-625	601-617	646-663	574-595
5	585-605	653-663	626-632	618-634	664-671	596-612
6	606-623	664-682	633-642	635-652	672-687	613-636
7	624-639	683-694	643-655	653-670	688-697	637-657
8	640-653	695-714	656-667	671-687	698-713	658-678
9	654-679	715-740	668-687	688-712	714-735	679-700
10	680-827	741-826	688-822	713-823	736-847	701-836

Age: 18

DECILE	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
1	316-505	311-551	453-587	326-532	335-580	338-518
2	506-542	552-602	588-602	533-566	581-622	519-550
3	543-565	603-627	603-614	567-585	623-644	551-582
4	566-585	628-648	615-621	586-608	645-660	583-598
5	586-599	649-664	622-630	609-629	661-673	599-613
6	600-616	665-679	631-639	630-646	674-688	614-639
7	617-639	680-695	640-647	647-664	689-697	640-657
8	640-651	696-717	648-659	665-679	698-710	658-675
9	652-678	718-737	660-679	680-697	711-726	676-696
10	679-827	738-826	680-822	698-823	727-847	697-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students with PROFOUND hearing loss
(>90 dB average threshhold in the better ear)

	Reading Caprhnsn	Spelling	Language	Concepts of Number	Math Caputatn	Math Applicatns
Age: 8						
DECILE						
1	316-432	311-435		326-444	335-440	338-432
2	433-448	436-451		445-462	441-463	433-450
3	449-457	452-466		463-469	464-489	451-464
4	458-465	467-484		470-478	490-510	465-475
5	466-485	485-509		479-487	511-524	476-487
6	486-495	510-521		488-498	525-540	488-497
7	496-511	522-548		499-522	541-567	498-509
8	512-534	549-574		523-533	568-585	510-517
9	535-564	575-603		534-565	586-640	518-537
10	565-827	604-826		566-823	641-847	538-836
Age: 9						
DECILE						
1	316-444	311-448		326-447	335-448	338-443
2	445-458	449-469		448-467	449-487	444-454
3	459-472	470-490		468-478	488-517	455-466
4	473-481	491-509		479-498	518-540	467-477
5	482-494	510-532		499-513	541-556	478-486
6	495-511	533-553		514-525	557-573	487-502
7	512-532	554-580		526-543	574-589	503-517
8	533-560	581-606		544-571	590-617	518-532
9	561-603	607-648		572-602	618-651	533-565
10	604-827	649-826		603-823	652-847	566-836
Age: 10						
DECILE						
1	316-444	311-445	453-572	426-459	335-479	338-441
2	445-462	446-478	573-586	460-479	480-511	442-464
3	463-481	479-504	587-600	480-499	512-540	465-477
4	482-496	505-531	601-606	500-513	541-559	478-491
5	497-514	532-550	607-615	514-533	560-574	492-506
6	515-542	551-578	616-621	534-551	575-594	507-522
7	543-555	579-600	622-627	552-570	595-624	523-534
8	556-577	601-638	628-639	571-595	625-649	535-554
9	578-611	639-675	640-671	596-625	650-667	555-586
10	612-827	676-826	672-822	626-823	668-847	587-836

	Reading Caprhnsn	Spelling	Language	Concepts of Number	Math Caputatn	Math Applicatns
Age: 11						
DECILE						
1	316-455	311-465	453-581	326-469	335-511	338-457
2	456-471	466-511	582-592	470-492	512-538	458-475
3	472-488	512-530	593-605	493-513	539-557	476-494
4	489-504	531-556	606-609	514-533	558-581	495-509
5	505-521	557-578	610-615	534-550	582-600	510-522
6	522-541	579-601	616-626	551-568	601-618	523-542
7	542-568	602-627	627-629	569-589	619-640	543-557
8	569-587	628-643	630-633	590-607	641-655	558-578
9	588-621	644-675	634-649	608-625	656-674	579-607
10	622-827	676-826	650-822	626-823	675-847	608-836
Age: 12						
DECILE						
1	316-468	311-485	453-577	326-493	335-531	338-467
2	469-485	486-522	578-589	494-519	532-564	468-494
3	486-505	523-550	590-601	520-541	565-588	495-517
4	506-521	551-576	602-609	542-560	589-613	518-530
5	522-540	577-600	610-613	561-575	614-629	531-552
6	541-555	601-616	614-620	576-587	630-645	553-565
7	556-579	617-636	621-625	588-606	646-660	566-582
8	580-599	637-653	626-635	607-626	661-675	583-596
9	600-623	654-679	636-648	627-649	676-698	597-624
10	624-827	680-826	649-822	650-823	699-847	625-836
Age: 13						
DECILE						
1	316-469	311-509	453-579	326-498	335-533	338-478
2	470-496	510-532	580-595	499-525	534-570	479-509
3	497-518	533-573	596-601	526-540	571-596	510-521
4	519-538	574-595	602-609	541-567	597-615	522-538
5	539-557	596-610	610-613	568-582	616-635	539-553
6	558-574	611-635	614-624	583-599	636-650	554-564
7	575-590	636-652	625-633	600-617	651-662	565-577
8	591-609	653-675	634-642	618-643	663-688	578-597
9	610-641	676-700	643-659	644-668	689-710	598-638
10	642-827	701-826	660-822	669-823	711-847	639-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students with PROFOUND hearing loss
(>90 dB average threshhold in the better ear)

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Computatn	Math Applicatns
Age: 14						
DECILE						
1	316-479	311-518	453-580	326-519	335-566	338-499
2	480-510	519-550	581-599	520-546	567-592	500-525
3	511-533	551-594	600-605	547-567	593-615	526-539
4	534-556	595-617	606-614	568-587	616-643	540-554
5	557-571	618-635	615-620	588-605	644-655	555-564
6	572-589	636-652	621-627	606-618	656-671	565-580
7	590-604	653-664	628-635	619-635	672-685	581-604
8	605-623	665-676	636-646	636-655	686-700	605-631
9	624-650	677-710	647-665	656-680	701-725	632-670
10	651-827	711-826	666-822	681-823	726-847	671-836
Age: 15						
DECILE						
1	316-488	311-528	453-576	326-527	335-566	338-506
2	489-527	529-591	577-598	528-555	567-610	507-524
3	528-553	592-614	599-604	556-578	611-635	525-550
4	554-569	615-636	605-616	579-596	636-647	551-572
5	570-583	637-652	617-622	597-616	648-663	573-586
6	584-598	653-666	623-629	617-634	664-674	587-603
7	599-615	667-680	630-639	635-651	675-689	604-630
8	616-635	681-695	640-652	652-668	690-708	631-651
9	636-658	696-717	653-676	669-694	709-727	652-684
10	659-827	718-826	677-822	695-823	728-847	685-836
Age: 16						
DECILE						
1	316-488	311-547	453-589	326-535	335-582	338-497
2	489-529	548-595	590-601	536-565	583-624	498-534
3	530-550	596-620	602-611	566-587	625-646	535-554
4	551-571	621-642	612-618	588-607	647-661	555-577
5	572-590	643-658	619-625	608-626	662-673	578-597
6	591-604	659-672	626-633	627-641	674-688	598-614
7	605-621	673-682	634-643	642-655	689-697	615-635
8	622-635	683-694	644-652	656-672	698-709	636-656
9	636-655	695-714	653-669	673-696	710-728	657-683
10	656-827	715-826	670-822	697-823	729-847	684-836

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Computatn	Math Applicatns
Age: 17						
DECILE						
1	316-494	311-561	453-587	326-540	335-584	338-514
2	495-531	562-604	588-599	541-573	585-623	515-543
3	532-555	605-633	600-608	574-597	624-646	544-565
4	556-577	634-652	609-615	598-612	647-661	566-584
5	578-594	653-664	616-625	613-625	662-672	585-600
6	595-608	665-674	626-632	626-647	673-682	601-620
7	609-624	675-686	633-640	648-660	683-694	621-637
8	625-635	687-700	641-653	661-679	695-712	638-656
9	636-656	701-721	654-670	680-701	713-733	657-681
10	657-827	722-826	671-822	702-823	734-847	682-836
Age: 18						
DECILE						
1	316-491	311-551	453-583	326-526	335-570	338-501
2	492-521	552-595	584-595	527-554	571-614	502-527
3	522-545	596-622	596-602	555-577	615-640	528-544
4	546-565	623-644	603-609	578-595	641-655	545-560
5	566-579	645-659	610-617	596-615	656-670	561-578
6	580-591	660-674	618-623	616-634	671-680	579-595
7	592-604	675-683	624-633	635-650	681-688	596-614
8	605-622	684-696	634-643	651-664	689-706	615-639
9	623-647	697-720	644-659	665-689	707-726	640-665
10	648-827	721-826	660-822	690-823	727-847	666-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students with SEVERE hearing loss
(71-90 dB average threshhold in the better ear)

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Computatn	Math Applicatns
Age: 8						
DECILE						
1	316-440	311-441		326-446	335-443	338-440
2	441-457	442-460		447-459	444-474	441-453
3	458-468	461-478		460-468	475-495	454-467
4	469-480	479-497		469-479	496-515	468-476
5	481-501	498-530		480-494	516-537	477-488
6	502-518	531-550		495-513	538-567	489-497
7	519-540	551-578		514-524	568-577	498-514
8	541-555	579-595		525-546	578-586	515-529
9	556-580	596-617		547-563	587-606	530-539
10	581-827	618-826		564-823	607-847	540-836
Age: 9						
DECILE						
1	316-430	311-433		326-450	335-480	338-443
2	431-454	434-458		451-467	481-509	444-458
3	455-464	459-481		468-477	510-523	459-468
4	465-478	482-512		478-486	524-545	469-477
5	479-498	513-538		487-501	546-552	478-495
6	499-511	539-563		502-516	553-567	496-501
7	512-536	564-586		517-530	568-588	502-513
8	537-555	587-603		531-557	589-619	514-531
9	556-576	604-627		558-580	620-645	532-546
10	577-827	628-826		581-823	646-847	547-836
Age: 10						
DECILE						
1	316-457	311-472		326-458	335-490	338-464
2	458-483	473-507		459-486	491-533	465-484
3	484-496	508-526		487-512	534-553	485-501
4	497-512	527-550		513-527	554-572	502-519
5	513-525	551-580		528-541	573-586	520-527
6	526-556	581-600		542-560	587-613	528-539
7	557-569	601-619		561-576	614-627	540-555
8	570-595	620-651		577-605	628-653	556-578
9	596-621	652-676		606-638	654-667	579-609
10	622-827	677-826		639-823	668-847	610-836

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Computatn	Math Applicatns
Age: 11						
DECILE						
1	316-470	311-501		326-492	335-529	338-465
2	471-488	502-521		493-513	530-565	466-482
3	489-511	522-550		514-537	566-575	483-500
4	512-531	551-579		538-553	576-595	501-509
5	532-543	580-593		554-565	596-611	510-525
6	544-565	594-612		566-578	612-625	526-543
7	566-577	613-639		579-589	626-639	544-557
8	578-596	640-653		590-605	640-654	558-573
9	597-619	654-678		606-625	655-688	574-601
10	620-827	679-826		626-823	689-847	602-836
Age: 12						
DECILE						
1	316-471	311-491	453-568	326-489	335-522	338-461
2	472-490	492-522	569-581	490-512	523-549	462-491
3	491-508	523-550	582-590	513-528	550-571	492-509
4	509-530	551-587	591-610	529-548	572-590	510-518
5	531-553	588-602	611-614	549-561	591-608	519-543
6	554-562	603-620	615-620	562-575	609-635	544-553
7	563-579	621-644	621-628	576-589	636-650	554-567
8	580-605	645-659	629-641	590-614	651-661	568-585
9	606-629	660-683	642-662	615-641	662-688	586-613
10	630-827	684-826	663-822	642-823	689-847	614-836
Age: 13						
DECILE						
1	316-477	311-527	453-586	326-502	335-539	338-472
2	478-514	528-553	587-599	503-524	540-574	473-509
3	515-542	554-588	600-605	525-553	575-613	510-532
4	543-557	589-606	606-613	554-582	614-626	533-558
5	558-572	607-629	614-619	583-599	627-639	559-562
6	573-585	630-649	620-625	600-612	640-653	563-570
7	586-598	650-662	626-634	613-630	654-678	571-591
8	599-611	663-675	635-642	631-650	679-688	592-618
9	612-640	676-702	643-661	651-671	689-709	619-648
10	641-827	703-826	662-822	672-823	710-847	649-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students with SEVERE hearing loss
(71-90 dB average threshhold in the better ear)

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Caputatn	Math Applicatns
Age: 14						
DECILE						
1	316-483	311-518	453-582	326-524	335-567	338-493
2	484-513	519-574	583-594	525-552	568-603	494-530
3	514-541	575-594	595-606	553-576	604-623	531-548
4	542-559	595-613	607-613	577-590	624-638	549-562
5	560-580	614-630	614-621	591-604	639-654	563-576
6	581-593	631-646	622-632	605-620	655-663	577-593
7	594-613	647-663	633-638	621-645	664-679	594-620
8	614-628	664-687	639-648	646-658	680-688	621-646
9	629-655	688-712	649-662	659-672	689-710	647-677
10	656-827	713-826	663-822	673-823	711-847	678-836
Age: 15						
DECILE						
1	316-508	311-521	453-583	326-541	335-577	338-512
2	509-536	522-591	584-594	542-559	578-624	513-539
3	537-554	592-607	595-604	560-588	625-645	540-558
4	555-572	608-625	605-614	589-609	646-660	559-576
5	573-593	626-646	615-625	610-620	661-672	577-591
6	594-612	647-669	626-631	621-635	673-680	592-610
7	613-626	670-678	632-647	636-650	681-695	611-631
8	627-644	679-700	648-657	651-680	696-712	632-660
9	645-660	701-721	658-674	681-700	713-734	661-687
10	661-827	722-826	675-822	701-823	735-847	688-836
Age: 16						
DECILE						
1	316-468	311-526	453-586	326-510	335-551	338-488
2	469-522	527-583	587-598	511-555	552-609	489-530
3	523-549	584-614	599-614	556-588	610-644	531-553
4	550-574	615-637	615-623	589-614	645-662	554-577
5	575-587	638-652	624-630	615-628	663-673	578-600
6	588-610	653-668	631-636	629-642	674-685	601-628
7	611-625	669-681	637-646	643-659	686-695	629-646
8	626-643	682-695	647-655	660-680	696-710	647-664
9	644-666	696-718	656-684	681-702	711-731	665-687
10	667-827	719-826	685-822	703-823	732-847	688-836

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Caputatn	Math Applicatns
Age: 17						
DECILE						
1	316-499	311-565	453-591	326-542	335-598	338-519
2	500-529	566-601	592-609	543-574	599-634	520-546
3	530-555	602-627	610-616	575-604	635-658	547-567
4	556-577	628-645	617-621	605-618	659-670	568-585
5	578-594	646-666	622-629	619-633	671-678	586-606
6	595-609	667-675	630-636	634-647	679-688	607-626
7	610-629	676-692	637-645	648-661	689-700	627-640
8	630-645	693-707	646-654	662-676	701-716	641-665
9	646-660	708-734	655-671	677-707	717-736	666-694
10	661-827	735-826	672-822	708-823	737-847	695-836
Age: 18						
DECILE						
1	316-495	311-551	453-582	326-524	335-578	338-503
2	496-537	552-602	583-595	525-562	579-624	504-529
3	538-558	603-629	596-605	563-583	625-649	530-549
4	559-575	630-649	606-614	584-606	650-662	550-570
5	576-591	650-662	615-621	607-625	663-671	571-586
6	592-604	663-674	622-630	626-639	672-680	587-605
7	605-621	675-690	631-636	640-657	681-690	606-627
8	622-637	691-702	637-646	658-671	691-707	628-649
9	638-655	703-732	647-665	672-689	708-727	650-678
10	656-827	733-826	666-822	690-823	728-847	679-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students with LESS THAN SEVERE hearing loss
(< 70 dB average threshhold in the better ear)

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Caputatn	Math Applicatns
Age: 8						
DECILE						
1	316-440	311-427		326-454	335-465	338-442
2	441-458	428-457		455-469	466-496	443-460
3	459-488	458-476		470-478	497-516	461-473
4	489-499	477-499		479-490	517-533	474-490
5	500-518	500-509		491-514	534-540	491-509
6	519-531	510-537		515-530	541-556	510-517
7	532-549	538-563		531-548	557-567	518-529
8	550-572	564-590		549-569	568-595	530-541
9	573-616	591-631		570-591	596-619	542-583
10	617-827	632-826		592-823	620-847	584-836
Age: 9						
DECILE						
1	316-456	311-458		326-457	335-483	338-467
2	457-486	459-483		458-502	484-536	468-491
3	487-505	484-511		503-526	537-550	492-505
4	506-529	512-533		527-539	551-566	506-525
5	530-554	534-562		540-550	567-570	526-536
6	555-563	563-582		551-567	571-587	537-547
7	564-577	583-598		568-577	588-603	548-559
8	578-594	599-621		578-595	604-630	560-579
9	595-619	622-652		596-624	631-649	580-604
10	620-827	653-826		625-823	650-847	605-836
Age: 10						
DECILE						
1	316-458	311-457		326-481	335-518	338-478
2	459-485	458-501		482-513	519-537	488-498
3	486-511	502-517		514-531	538-557	499-523
4	512-538	518-545		532-537	558-580	524-533
5	539-556	546-565		538-557	581-591	534-538
6	557-565	566-594		558-571	592-611	539-558
7	566-580	595-610		572-584	612-629	559-570
8	581-595	611-630		585-601	630-643	571-579
9	596-626	631-656		602-621	644-660	580-610
10	627-827	657-826		622-823	661-847	611-836

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Caputatn	Math Applicatns
Age: 11						
DECILE						
1	316-488	311-499	453-588	326-502	335-530	338-491
2	489-525	500-534	589-596	503-534	531-567	492-519
3	526-543	535-567	597-608	535-550	568-588	520-537
4	544-560	568-590	609-611	551-565	589-600	538-553
5	561-581	591-611	612-620	566-580	601-616	554-561
6	582-591	612-622	621-630	581-598	617-630	562-573
7	592-604	623-634	631-634	599-610	631-641	574-593
8	605-619	635-659	635-643	611-629	642-654	594-612
9	620-642	660-689	644-658	630-653	655-671	613-621
10	643-827	690-826	659-822	654-823	672-847	622-836
Age: 12						
DECILE						
1	316-494	311-504	453-585	326-512	335-545	338-497
2	495-527	505-535	586-599	513-533	546-567	498-516
3	528-545	536-579	600-603	534-547	568-588	517-539
4	546-572	580-595	604-610	548-570	589-597	540-550
5	573-583	596-609	611-619	571-588	598-619	551-562
6	584-597	610-628	620-627	589-597	620-635	563-575
7	598-607	629-646	628-637	598-613	636-653	576-589
8	608-626	647-672	638-650	614-625	654-666	590-605
9	627-655	673-686	651-660	626-658	667-690	606-629
10	656-827	687-826	661-822	659-823	691-847	630-836
Age: 13						
DECILE						
1	316-507	311-519	453-586	326-533	335-568	338-515
2	508-547	520-576	587-604	534-560	569-591	516-543
3	548-570	577-600	605-611	561-582	592-614	544-556
4	571-577	601-617	612-620	583-598	615-631	557-573
5	578-604	618-636	621-628	599-615	632-645	574-591
6	605-617	637-651	629-637	616-621	646-662	592-609
7	618-628	652-655	638-647	622-637	663-680	610-616
8	629-643	656-677	648-658	638-655	681-689	617-637
9	644-658	678-706	659-668	656-682	690-715	638-657
10	659-827	707-826	669-822	683-823	716-847	658-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students with LESS THAN SEVERE hearing loss
(< 70 dB average threshhold in the better ear)

	Reading Comprhnsn	Spelling	Language	Concepts of Number	Math Computatn	Math Applicatns
Age: 14						
DECILE						
1	316-512	311-513	453-589	326-521	335-565	338-519
2	513-544	514-571	590-602	522-561	566-602	520-536
3	545-561	572-611	603-610	562-580	603-623	537-561
4	562-585	612-628	611-624	581-595	624-643	562-575
5	586-599	629-647	625-634	596-620	644-660	576-589
6	600-613	648-663	635-645	621-637	661-672	590-621
7	614-638	664-675	646-655	638-652	673-689	622-630
8	639-651	676-698	656-664	653-676	690-709	631-646
9	652-684	699-721	665-687	677-696	710-727	647-669
10	685-827	722-826	688-822	697-823	728-847	670-836
Age: 15						
DECILE						
1	316-499	311-543	453-587	326-533	335-595	338-520
2	500-550	544-587	588-604	534-571	596-617	521-556
3	551-575	588-609	605-615	572-593	618-637	557-567
4	576-598	610-619	616-621	594-614	638-652	568-585
5	599-613	620-635	622-637	615-624	653-666	586-606
6	614-629	636-654	638-644	625-639	667-674	607-618
7	630-646	655-666	645-660	640-655	675-683	619-645
8	647-659	667-682	661-672	656-672	684-692	646-671
9	660-691	683-706	673-686	673-693	693-711	672-679
10	692-827	707-826	687-822	694-823	712-847	680-836
Age: 16						
DECILE						
1	316-525	311-558	453-594	326-537	335-561	338-549
2	526-552	559-600	595-606	538-573	562-594	550-559
3	553-571	601-621	607-613	574-594	595-632	560-571
4	572-590	622-632	614-625	595-611	633-644	572-591
5	591-606	633-646	626-633	612-630	645-659	592-611
6	607-618	647-660	634-640	631-648	660-673	612-635
7	619-637	661-674	641-650	649-664	674-686	636-655
8	638-647	675-691	651-663	665-672	687-700	656-669
9	648-682	692-717	664-679	673-701	701-719	670-688
10	683-827	718-826	680-822	702-823	720-847	689-836

	Reading Comprhnsn	Spelling	Language	Concepts of Number	Math Computatn	Math Applicatns
Age: 17						
DECILE						
1	316-487	311-514	453-583	326-502	335-566	338-510
2	488-545	515-583	584-604	503-558	567-609	511-544
3	546-563	584-611	605-613	559-598	610-638	545-579
4	564-578	612-635	614-622	599-615	639-665	580-599
5	579-597	636-656	623-634	616-639	666-673	600-612
6	598-626	657-675	635-647	640-656	674-688	613-640
7	627-643	676-691	648-662	657-672	689-696	641-661
8	644-659	692-717	663-673	673-686	697-708	662-680
9	660-690	718-747	674-689	687-712	709-734	681-700
10	691-827	748-826	690-822	713-823	735-847	701-836
Age: 18						
DECILE						
1	316-526	311-572	453-585	326-556	335-599	338-527
2	527-549	573-610	586-599	557-584	600-627	528-560
3	550-570	611-628	600-610	585-595	628-647	561-576
4	571-588	629-652	611-622	596-617	648-662	577-600
5	589-601	653-672	623-632	618-632	663-672	601-613
6	602-620	673-683	633-642	633-647	673-686	614-633
7	621-637	684-694	643-645	648-656	687-694	634-651
8	638-653	695-713	646-659	657-673	695-701	652-665
9	654-686	714-739	660-677	674-698	702-719	666-682
10	687-827	740-826	678-822	699-823	720-847	683-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students with NO reported handicaps in addition to their hearing impairment

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 8						
DECILE						
1	316-439	311-444	453-576	326-453	335-462	338-441
2	440-453	445-461	577-594	454-469	463-489	442-458
3	454-467	462-482	595-600	470-475	490-509	459-472
4	468-487	483-502	601-613	476-486	510-524	473-483
5	488-498	503-520	614-617	487-501	525-539	484-496
6	499-516	521-537	618-628	502-518	540-560	497-509
7	517-536	538-566	629-634	519-532	561-570	510-516
8	537-553	567-582	635-641	533-550	571-594	517-529
9	554-590	583-619	642-657	551-589	595-638	530-553
10	591-827	620-826	658-822	590-823	639-847	554-836
Age: 9						
DECILE						
1	316-447	311-456	453-575	326-457	335-483	338-447
2	448-465	457-481	576-584	458-475	484-521	448-466
3	466-481	482-511	585-594	476-498	522-540	467-480
4	482-495	512-532	595-601	499-514	541-553	481-493
5	496-518	533-552	602-611	515-528	554-567	494-509
6	519-541	553-579	612-616	529-546	568-586	510-520
7	542-558	580-601	617-626	547-567	587-604	521-538
8	559-579	602-618	627-634	568-584	605-630	539-556
9	580-605	619-651	635-649	585-611	631-652	557-582
10	606-827	652-826	650-822	612-823	653-847	583-836
Age: 10						
DECILE						
1	316-455	311-475	453-576	326-471	335-510	338-463
2	456-480	476-509	577-591	472-492	511-535	464-483
3	481-496	510-529	592-604	493-513	536-556	484-493
4	497-518	530-550	605-609	514-532	557-573	494-510
5	519-542	551-576	610-617	533-545	574-589	511-527
6	543-557	577-599	618-623	546-565	590-616	528-538
7	558-571	600-618	624-632	566-580	617-635	539-553
8	572-594	619-649	633-643	581-604	636-652	554-577
9	595-631	650-676	644-669	605-630	653-669	578-609
10	632-827	677-826	670-822	631-823	670-847	610-836

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 11						
DECILE						
1	316-468	311-503	453-583	326-485	335-536	338-472
2	469-490	504-533	584-594	486-520	537-563	473-500
3	491-512	534-567	595-605	521-542	564-582	501-516
4	513-534	568-585	606-610	543-560	583-599	517-534
5	535-554	586-601	611-618	561-574	600-615	535-547
6	555-571	602-623	619-625	575-588	616-630	548-559
7	572-586	624-639	626-631	589-604	631-642	560-574
8	587-603	640-655	632-640	605-618	643-661	575-597
9	604-634	656-683	641-654	619-638	662-687	598-622
10	635-827	684-826	655-822	639-823	688-847	623-836
Age: 12						
DECILE						
1	316-480	311-513	453-580	326-512	335-552	338-491
2	481-503	514-550	581-591	513-539	553-583	492-516
3	504-522	551-577	592-604	540-555	584-603	517-535
4	523-544	578-600	605-609	556-573	604-622	536-552
5	545-565	601-615	610-617	574-584	623-636	553-564
6	566-579	616-632	618-621	585-598	637-652	565-577
7	580-597	633-650	622-629	599-614	653-662	578-590
8	598-612	651-663	630-643	615-630	663-679	591-606
9	613-635	664-685	644-658	631-655	680-698	607-636
10	636-827	686-826	659-822	656-823	699-847	637-836
Age: 13						
DECILE						
1	316-485	311-522	453-585	326-523	335-565	338-503
2	486-522	523-576	586-598	524-547	566-595	504-529
3	523-548	577-600	599-605	548-571	596-617	530-544
4	549-566	601-617	606-613	572-589	618-634	545-560
5	567-579	618-635	614-621	590-604	635-650	561-570
6	580-593	636-650	622-629	605-618	651-665	571-586
7	594-609	651-664	630-638	619-638	666-683	587-601
8	610-629	665-678	639-646	639-655	684-697	602-624
9	630-651	679-710	647-663	656-678	698-718	625-653
10	652-827	711-826	664-822	679-823	719-847	654-836

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Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students with NO reported handicaps in addition to their hearing impairment

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 14						
DECILE						
1	316-505	311-534	453-590	326-541	335-580	338-519
2	506-536	535-591	591-602	542-571	581-614	520-544
3	537-557	592-619	603-611	572-587	615-636	545-561
4	558-572	620-633	612-619	588-606	637-652	562-570
5	573-591	634-650	620-625	607-619	653-665	571-587
6	592-604	651-662	626-634	620-637	666-679	588-609
7	605-623	663-674	635-643	638-651	680-688	610-626
8	624-640	675-692	644-656	652-666	689-707	627-654
9	641-664	693-718	657-670	667-688	708-727	655-680
10	665-827	719-826	671-822	689-823	728-847	681-836
Age: 15						
DECILE						
1	316-512	311-580	453-583	326-552	335-598	338-521
2	513-550	581-606	584-599	553-578	599-633	522-549
3	551-566	607-627	600-609	579-597	634-650	550-571
4	567-584	628-647	610-619	598-618	651-664	572-585
5	585-600	648-662	620-625	619-630	665-673	586-601
6	601-617	663-674	626-635	631-646	674-684	602-628
7	618-631	675-690	636-646	647-661	685-697	629-649
8	632-648	691-701	647-662	662-680	698-713	650-669
9	649-670	702-721	663-678	681-700	714-737	670-692
10	671-827	722-826	679-822	701-823	738-847	693-836
Age: 16						
DECILE						
1	316-518	311-581	453-595	326-555	335-611	338-523
2	519-548	582-617	596-605	556-586	612-640	524-553
3	549-571	618-634	606-615	587-607	641-659	554-582
4	572-587	635-651	616-622	608-625	660-671	583-600
5	588-601	652-663	623-630	626-638	672-680	601-622
6	602-617	664-674	631-638	639-654	681-689	623-639
7	618-631	675-686	639-646	655-666	690-700	640-655
8	632-644	687-696	647-657	667-683	701-714	656-672
9	645-668	697-718	658-680	684-704	715-735	673-691
10	669-827	719-826	681-822	705-823	736-847	692-836

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 17						
DECILE						
1	316-521	311-600	453-594	326-565	335-612	338-543
2	522-555	601-627	595-605	566-594	613-645	544-565
3	556-576	628-646	606-614	595-612	646-663	566-586
4	577-591	647-662	615-621	613-627	664-672	587-601
5	592-605	663-673	622-629	628-641	673-682	602-620
6	606-622	674-682	630-636	642-656	683-689	621-635
7	623-633	683-693	637-646	657-670	690-704	636-653
8	634-646	694-711	647-660	671-686	705-719	654-670
9	647-671	712-736	661-678	687-712	720-738	671-701
10	672-827	737-826	679-822	713-823	739-847	702-836
Age: 18						
DECILE						
1	316-515	311-586	453-584	326-550	335-608	338-522
2	516-548	587-616	585-598	551-579	609-639	523-545
3	549-565	617-639	599-605	580-595	640-655	546-562
4	566-579	640-652	606-613	596-615	656-666	563-578
5	580-591	653-666	614-621	616-630	667-675	579-596
6	592-604	667-675	622-629	631-644	676-687	597-614
7	605-618	676-691	630-638	645-658	688-696	615-637
8	619-636	692-704	639-647	659-674	697-709	638-654
9	637-657	705-728	648-664	675-695	710-728	655-680
10	658-827	729-826	665-822	696-823	729-847	681-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students WITH reported handicaps in addition to their hearing impairment

	Reading Comprhnsn	Spelling	Language	Concepts of Number	Math Computatn	Math Applicatns
Age: 8						
DECILE						
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
Age: 9						
DECILE						
1	316-435	311-425		326-443	335-413	338-438
2	436-449	426-436		444-452	414-458	439-451
3	450-457	437-452		453-469	459-480	452-459
4	458-468	453-469		470-477	481-504	460-468
5	469-478	470-491		478-484	505-519	469-475
6	479-490	492-503		485-498	520-550	476-483
7	491-504	504-526		499-517	551-557	484-500
8	505-524	527-560		518-535	558-573	501-517
9	525-555	561-601		536-564	574-599	518-531
10	556-827	602-826		565-823	600-847	532-836
Age: 10						
DECILE						
1	316-435	311-428		326-443	335-450	338-441
2	436-452	429-452		444-461	451-491	442-452
3	453-462	453-471		462-481	492-511	453-473
4	463-483	472-489		482-509	512-537	474-491
5	484-497	490-515		510-520	538-556	492-506
6	498-511	516-533		521-532	557-569	507-523
7	512-536	534-570		533-553	570-586	524-531
8	537-558	571-600		554-575	587-603	532-547
9	559-579	601-620		576-605	604-641	548-573
10	580-827	621-826		606-823	642-847	574-836
Age: 11						
DECILE						
1	316-453	311-456		326-457	335-473	338-450
2	454-462	457-474		458-477	474-524	451-464
3	463-478	475-504		478-493	525-539	465-474
4	479-488	505-518		494-508	540-551	475-487
5	489-503	519-533		509-525	552-572	488-503
6	504-522	534-555		526-538	573-593	504-509
7	523-543	556-579		539-551	594-619	510-517
8	544-564	580-603		552-575	620-644	518-549
9	565-598	604-633		576-615	645-654	550-579
10	599-827	634-826		616-823	655-847	580-836
Age: 12						
DECILE						
1	316-457	311-468		326-460	335-484	338-453
2	458-470	469-493		461-485	485-526	454-465
3	471-481	494-517		486-504	527-539	466-482
4	482-494	518-532		505-518	540-558	483-501
5	495-519	533-550		519-531	559-569	502-513
6	520-531	551-579		532-549	570-589	514-524
7	532-545	580-601		550-565	590-611	525-539
8	546-573	602-620		566-581	612-638	540-559
9	574-605	621-666		582-612	639-668	560-582
10	606-827	667-826		613-823	669-847	583-836
Age: 13						
DECILE						
1	316-462	311-484	453-573	326-480	335-508	338-468
2	463-480	485-519	574-587	481-502	509-547	469-487
3	481-498	520-537	588-599	503-520	548-567	488-508
4	499-518	538-557	600-609	521-532	568-584	509-518
5	519-536	558-585	610-612	533-552	585-602	519-532
6	537-556	586-601	613-619	553-573	603-623	533-550
7	557-566	602-619	620-630	574-591	624-638	551-562
8	567-587	620-652	631-637	592-612	639-653	563-580
9	588-621	653-677	638-655	613-635	654-671	581-626
10	622-827	678-826	656-822	636-823	672-847	627-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Students WITH reported handicaps in addition to their hearing impairment

	Reading Comprhnsn	Spelling	Language	Concepts of Number	Math Computatn	Math Applicatns
Age: 14						
DECILE						
1	316-465	311-487	453-559	326-487	335-526	338-478
2	466-481	488-515	560-578	488-522	527-555	479-505
3	482-500	516-550	579-588	523-537	556-584	506-519
4	501-527	551-573	589-604	538-555	585-603	520-531
5	528-544	574-600	605-610	556-568	604-623	532-538
6	545-564	601-610	611-620	569-585	624-642	539-548
7	565-581	611-630	621-632	586-599	643-659	549-573
8	582-597	631-660	633-643	600-620	660-673	574-600
9	598-631	661-682	644-664	621-654	674-707	601-633
10	632-827	683-826	665-822	655-823	708-847	634-836
Age: 15						
DECILE						
1	316-465	311-498	453-580	326-493	335-535	338-486
2	466-490	499-522	581-591	494-532	536-574	487-511
3	491-524	523-558	592-600	533-549	575-609	512-527
4	525-539	559-585	601-608	550-560	610-619	528-544
5	540-558	586-603	609-615	561-578	620-638	545-565
6	559-577	604-630	616-620	579-597	639-650	566-582
7	578-596	631-647	621-630	598-616	651-665	583-597
8	597-613	648-664	631-643	617-636	666-680	598-613
9	614-642	665-679	644-660	637-662	681-706	614-631
10	643-827	680-826	661-822	663-823	707-847	632-836
Age: 16						
DECILE						
1	316-453	311-473	453-562	326-466	335-511	338-456
2	454-472	474-511	563-585	467-507	512-546	457-488
3	473-489	512-540	586-594	508-532	547-568	489-510
4	490-526	541-576	595-601	533-555	569-604	511-539
5	527-545	577-601	602-615	556-575	605-630	540-553
6	546-562	602-625	616-622	576-587	631-645	554-565
7	563-583	626-650	623-630	588-606	646-659	566-585
8	584-612	651-674	631-639	607-633	660-683	586-612
9	613-630	675-704	640-658	634-660	684-707	613-644
10	631-827	705-826	659-822	661-823	708-847	645-836

	Reading Comprhnsn	Spelling	Language	Concepts of Number	Math Computatn	Math Applicatns
Age: 17						
DECILE						
1	316-467	311-484	453-569	326-480	335-530	338-466
2	468-489	485-528	570-583	481-525	531-569	467-507
3	490-507	529-576	584-597	526-545	570-604	508-520
4	508-527	577-598	598-604	546-568	605-627	521-535
5	528-543	599-611	605-612	569-584	628-641	536-556
6	544-559	612-633	613-622	585-607	642-652	557-570
7	560-579	634-656	623-628	608-617	653-665	571-592
8	580-610	657-675	629-642	618-641	666-681	593-621
9	611-635	676-697	643-665	642-662	682-697	622-669
10	636-827	698-826	666-822	663-823	698-847	670-836
Age: 18						
DECILE						
1	316-469	311-504	453-572	326-493	335-539	338-477
2	470-490	505-547	573-588	494-523	540-568	478-502
3	491-513	548-578	589-599	524-541	569-598	503-517
4	514-535	579-601	600-605	542-558	599-624	518-536
5	536-553	602-630	606-614	559-576	625-644	537-553
6	554-574	631-651	615-622	577-598	645-659	554-574
7	575-594	652-670	623-631	599-622	660-673	575-596
8	595-608	671-691	632-642	623-647	674-688	597-616
9	609-643	692-720	643-659	648-672	689-709	617-646
10	644-827	721-826	660-822	673-823	710-847	647-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: White, non-Hispanic students

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Computatn	Math Applicatns
Age: 8						
DECILE						
1	316-447	311-443		326-458	335-458	338-455
2	448-462	444-467		459-475	459-493	456-470
3	463-478	468-482		476-484	494-520	471-481
4	479-494	483-510		485-496	521-534	482-497
5	495-510	511-529		497-514	535-550	498-502
6	511-529	530-551		515-524	551-567	503-511
7	530-544	552-575		525-539	568-582	512-519
8	545-564	576-594		540-556	583-599	520-535
9	565-606	595-631		557-593	600-641	536-562
10	607-827	632-826		594-823	642-847	563-836
Age: 9						
DECILE						
1	316-461	311-465	453-575	326-465	335-483	338-456
2	462-477	466-492	576-589	466-480	484-521	457-473
3	478-492	493-519	590-596	481-504	522-549	474-486
4	493-509	520-542	597-607	505-519	550-562	487-502
5	510-527	543-561	608-614	520-532	563-571	503-517
6	528-550	562-585	615-625	533-553	572-588	518-527
7	551-563	586-602	626-630	554-570	589-610	528-544
8	564-586	603-626	631-639	571-590	611-631	545-558
9	587-614	627-657	640-658	591-616	632-652	559-592
10	615-827	658-826	659-822	617-823	653-847	593-836
Age: 10						
DECILE						
1	316-457	311-465	453-579	326-480	335-510	338-467
2	458-482	466-504	580-595	481-508	511-533	468-490
3	483-499	505-529	596-605	509-519	534-555	491-507
4	500-523	530-550	606-611	520-536	556-569	508-524
5	524-545	551-579	612-618	537-551	570-589	525-530
6	546-562	580-601	619-621	552-570	590-615	531-543
7	563-577	602-624	622-627	571-591	616-636	544-562
8	578-596	625-652	628-639	592-607	637-651	563-579
9	597-630	653-677	640-658	608-635	652-670	580-616
10	631-827	678-826	659-822	636-823	671-847	617-836

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Computatn	Math Applicatns
Age: 11						
DECILE						
1	316-473	311-502	453-588	326-491	335-531	338-476
2	474-499	503-531	589-598	492-524	532-567	477-500
3	500-520	532-563	599-608	525-545	568-589	501-520
4	521-538	564-586	609-612	546-565	590-606	521-539
5	539-565	587-602	613-621	566-580	607-622	540-550
6	566-579	603-625	622-628	581-593	623-639	551-562
7	580-596	626-643	629-633	594-607	640-652	563-577
8	597-616	644-665	634-642	608-620	653-668	578-600
9	617-636	666-688	643-655	621-640	669-689	601-621
10	637-827	689-826	656-822	641-823	690-847	622-836
Age: 12						
DECILE						
1	316-484	311-513	453-580	326-509	335-550	338-490
2	485-512	514-550	581-591	510-540	551-571	491-516
3	513-531	551-578	592-605	541-559	572-599	517-534
4	532-553	579-600	606-610	560-575	600-623	535-552
5	554-569	601-615	611-618	576-586	624-642	553-566
6	570-588	616-634	619-623	587-604	643-654	567-580
7	589-602	635-652	624-631	605-619	655-668	581-590
8	603-615	653-665	632-643	620-635	669-683	591-605
9	616-637	666-691	644-658	636-661	684-702	606-636
10	638-827	692-826	659-822	662-823	703-847	637-836
Age: 13						
DECILE						
1	316-488	311-523	453-586	326-514	335-552	338-490
2	489-525	524-574	587-600	515-541	553-593	491-525
3	526-550	575-600	601-609	542-571	594-619	526-544
4	551-564	601-616	610-614	572-587	620-632	545-559
5	565-582	617-635	615-622	588-604	633-649	560-569
6	583-596	636-652	623-632	605-618	650-660	570-585
7	597-611	653-664	633-639	619-635	661-674	586-607
8	612-631	665-682	640-650	636-655	675-689	608-628
9	632-651	683-711	651-665	656-676	690-715	629-655
10	652-827	712-826	666-822	677-823	716-847	656-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: White, non-Hispanic students

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 14						
DECILE						
1	316-518	311-553	453-595	326-554	335-590	338-526
2	519-550	554-601	596-605	555-576	591-619	527-542
3	551-571	602-623	606-615	577-595	620-645	543-561
4	572-588	624-636	616-623	596-612	646-659	562-574
5	589-602	637-652	624-630	613-625	660-670	575-595
6	603-615	653-664	631-638	626-642	671-683	596-616
7	616-630	665-675	639-646	643-656	684-689	617-635
8	631-646	676-695	647-657	657-671	690-710	636-664
9	647-669	696-721	658-676	672-695	711-727	665-681
10	670-827	722-826	677-822	696-823	728-847	682-836
Age: 15						
DECILE						
1	316-517	311-572	453-590	326-546	335-599	338-517
2	518-554	573-601	591-604	547-571	600-631	518-548
3	555-573	602-628	605-615	572-597	632-648	549-574
4	574-590	629-647	616-621	598-618	649-661	575-591
5	591-604	648-661	622-627	619-630	662-672	592-610
6	605-620	662-673	628-639	631-648	673-684	611-630
7	621-637	674-682	640-647	649-662	685-697	631-648
8	638-652	683-700	648-663	663-680	698-710	649-669
9	653-674	701-720	664-680	681-702	711-737	670-690
10	675-827	721-826	681-822	703-823	738-847	691-836
Age: 16						
DECILE						
1	316-521	311-577	453-594	326-550	335-590	338-527
2	522-556	578-613	595-607	551-581	591-631	528-554
3	557-575	614-635	608-617	582-603	632-654	555-576
4	576-595	636-652	618-625	604-622	655-670	577-599
5	596-608	653-665	626-631	623-638	671-680	600-615
6	609-622	666-675	632-639	639-654	681-689	616-635
7	623-634	676-688	640-647	655-667	690-702	636-651
8	635-646	689-699	648-660	668-684	703-715	652-670
9	647-670	700-720	661-680	685-704	716-736	671-690
10	671-827	721-826	681-822	705-823	737-847	691-836

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 17						
DECILE						
1	316-523	311-587	453-594	326-557	335-607	338-525
2	524-556	588-622	595-605	558-590	608-638	526-564
3	557-576	623-644	606-614	591-611	639-660	565-584
4	577-593	645-660	615-623	612-626	661-670	585-600
5	594-608	661-672	624-630	627-646	671-680	601-619
6	609-624	673-682	631-639	647-657	681-690	620-637
7	625-636	683-694	640-649	658-671	691-704	638-655
8	637-651	695-711	650-664	672-688	705-720	656-673
9	652-676	712-739	665-683	689-713	721-741	674-706
10	677-827	740-826	684-822	714-823	742-847	707-836
Age: 18						
DECILE						
1	316-517	311-578	453-588	326-545	335-596	338-517
2	518-554	579-616	589-600	546-579	597-637	518-545
3	555-571	617-643	601-608	580-598	638-655	546-565
4	572-585	644-656	609-617	599-620	656-668	566-586
5	586-599	657-672	618-624	621-634	669-678	587-598
6	600-611	673-678	625-633	635-650	679-688	599-618
7	612-627	679-692	634-642	651-664	689-697	619-637
8	628-642	693-709	643-650	665-679	698-710	638-656
9	643-660	710-734	651-666	680-697	711-731	657-679
10	661-827	735-826	667-822	698-823	732-847	680-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Black students

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 8						
DECILE						
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
Age: 9						
DECILE						
1	316-416	311-437		326-440	335-445	338-427
2	417-442	438-460		441-455	446-472	428-444
3	443-451	461-468		456-463	473-509	445-459
4	452-463	469-481		464-472	510-523	460-465
5	464-471	482-489		473-483	524-540	466-469
6	472-484	490-512		484-504	541-551	470-482
7	485-493	513-534		505-521	552-565	483-491
8	494-522	535-577		522-548	566-581	492-503
9	523-556	578-601		549-572	582-604	504-535
10	557-827	602-826		573-823	605-847	536-836
Age: 10						
DECILE						
1	316-438	311-443		326-441	335-466	338-432
2	439-456	444-474		442-471	467-494	433-453
3	457-475	475-492		472-482	495-523	454-469
4	476-490	493-514		483-499	524-551	470-487
5	491-509	515-537		500-518	552-568	488-496
6	510-523	538-572		519-537	569-588	497-525
7	524-546	573-594		538-560	589-611	526-535
8	547-563	595-601		561-574	612-641	536-548
9	564-585	602-624		575-595	642-655	549-561
10	586-827	625-826		596-823	656-847	562-836

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 11						
DECILE						
1	316-449	311-455		326-460	335-477	338-443
2	450-463	456-476		461-472	478-535	444-455
3	464-477	477-519		473-488	536-547	456-466
4	478-492	520-539		489-523	548-566	467-500
5	493-512	540-569		524-539	567-574	501-509
6	513-534	570-585		540-550	575-594	510-517
7	535-548	586-599		551-560	595-614	518-532
8	549-566	600-631		561-580	615-635	533-558
9	567-587	632-653		581-606	636-653	559-587
10	588-827	654-826		607-823	654-847	588-836
Age: 12						
DECILE						
1	316-452	311-474		326-467	335-498	338-453
2	453-470	475-497		468-495	499-529	454-467
3	471-483	498-522		496-511	530-546	468-491
4	484-508	523-550		512-523	547-566	492-509
5	509-525	551-557		524-532	567-588	510-517
6	526-543	558-601		533-549	589-602	518-527
7	544-552	602-611		550-565	603-619	528-539
8	553-570	612-642		566-585	620-631	540-554
9	571-588	643-662		586-602	632-652	555-576
10	589-827	663-826		603-823	653-847	577-836
Age: 13						
DECILE						
1	316-463	311-490		326-475	335-515	338-474
2	464-479	491-521		476-513	516-551	475-494
3	480-500	522-543		514-529	552-568	495-513
4	501-517	544-580		530-537	569-583	514-522
5	518-535	581-600		538-554	584-597	523-532
6	536-554	601-613		555-569	598-617	533-544
7	555-570	614-641		570-592	618-628	545-562
8	571-585	642-652		593-613	629-655	563-577
9	586-626	653-685		614-638	656-688	578-619
10	627-827	686-826		639-823	689-847	620-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Black students

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 14						
DECILE						
1	316-469	311-496		326-486	335-523	338-469
2	470-481	497-516		487-520	524-565	470-494
3	482-509	517-550		521-541	566-588	495-525
4	510-530	551-577		542-552	589-607	526-536
5	531-547	578-603		553-573	608-623	537-554
6	548-566	604-625		574-587	624-642	555-562
7	567-580	626-643		588-602	643-659	563-575
8	581-592	644-658		603-619	660-676	576-594
9	593-615	659-690		620-649	677-704	595-624
10	616-827	691-826		650-823	705-847	625-836
Age: 15						
DECILE						
1	316-465	311-504		326-490	335-519	338-478
2	466-489	505-547		491-526	520-568	479-521
3	490-515	548-585		527-546	569-602	522-533
4	516-541	586-608		547-562	603-617	534-548
5	542-554	609-622		563-589	618-637	549-558
6	555-569	623-634		590-607	638-656	559-564
7	570-590	635-650		608-619	657-670	565-574
8	591-619	651-675		620-634	671-684	575-595
9	620-632	676-705		635-650	685-697	596-621
10	633-827	706-826		651-823	698-847	622-836
Age: 16						
DECILE						
1	316-457	311-511	453-563	326-499	335-518	338-450
2	458-491	512-561	564-591	500-537	519-577	451-488
3	492-532	562-589	592-597	538-551	578-606	489-514
4	533-548	590-617	598-603	552-570	607-632	515-528
5	549-566	618-627	604-609	571-600	633-646	529-548
6	567-578	628-642	610-621	601-627	647-661	549-562
7	579-591	643-654	622-627	628-635	662-673	563-586
8	592-608	655-676	628-637	636-654	674-688	587-627
9	609-641	677-700	638-650	655-671	689-706	628-653
10	642-827	701-826	651-822	672-823	707-847	654-836

	Reading Cmprhnsn	Spelling	Language	Concepts of Number	Math Cmputatn	Math Applicatns
Age: 17						
DECILE						
1	316-469	311-492	453-574	326-495	335-547	338-475
2	470-489	493-564	575-583	496-537	548-577	476-507
3	490-517	565-586	584-597	538-555	578-610	508-519
4	518-539	587-621	598-606	556-584	611-633	520-543
5	540-555	622-641	607-610	585-604	634-654	544-550
6	556-574	642-659	611-619	605-617	655-663	551-563
7	575-593	660-674	620-631	618-621	664-673	564-581
8	594-620	675-690	632-638	622-639	674-685	582-610
9	621-636	691-718	639-648	640-665	686-697	611-641
10	637-827	719-826	649-822	666-823	698-847	642-836
Age: 18						
DECILE						
1	316-478	311-523	453-569	326-500	335-551	338-480
2	479-501	524-576	570-582	501-533	552-587	481-500
3	502-526	577-601	583-589	534-554	588-613	501-515
4	527-539	602-620	590-599	555-570	614-630	516-527
5	540-556	621-635	600-607	571-584	631-646	528-544
6	557-571	636-652	608-613	585-598	647-659	545-556
7	572-584	653-672	614-621	599-617	660-671	557-577
8	585-595	673-691	622-629	618-634	672-685	578-598
9	596-616	692-716	630-640	635-655	686-698	599-624
10	617-827	717-826	641-822	656-823	699-847	625-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Hispanic students

	Reading Caprhnsn	Spelling	Language	Concepts of Number	Math Caputatn	Math Applicatns
Age: 8						
DECILE						
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
Age: 9						
DECILE						
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
Age: 10						
DECILE						
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
Age: 11						
DECILE						
1	316-458	311-453		326-466	335-472	
2	459-467	454-497		467-492	473-530	
3	468-480	498-515		493-501	531-542	
4	481-493	516-528		502-512	543-558	
5	494-506	529-543		513-527	559-571	
6	507-520	544-556		528-545	572-588	
7	521-536	557-587		546-556	589-614	
8	537-552	588-604		557-567	615-628	
9	553-577	605-634		568-592	629-651	
10	578-827	635-826		593-823	652-847	
Age: 12						
DECILE						
1	316-459	311-467		326-467	335-524	
2	460-471	468-490		468-497	525-553	
3	472-483	491-518		498-515	554-567	
4	484-490	519-536		516-533	568-583	
5	491-499	537-550		534-546	584-596	
6	500-522	551-585		547-556	597-613	
7	523-540	586-601		557-566	614-630	
8	541-570	602-626		567-586	631-640	
9	571-616	627-649		587-614	641-655	
10	617-827	650-826		615-823	656-847	
Age: 13						
DECILE						
1	316-463	311-480		326-498	335-517	338-471
2	464-479	481-511		499-518	518-562	472-502
3	480-496	512-550		519-533	563-590	503-509
4	497-525	551-575		534-557	591-599	510-520
5	526-540	576-590		558-573	600-609	521-552
6	541-565	591-602		574-589	610-638	553-562
7	566-578	603-623		590-606	639-656	563-579
8	579-593	624-650		607-633	657-682	580-599
9	594-610	651-675		634-661	683-709	600-622
10	611-827	676-826		662-823	710-847	623-836

Special Norms for Subgroups of Hearing-Impaired Norming Population

Stanford Achievement Test
Spring, 1983

Subgroup: Hispanic students

	Reading Comprhnsn	Spelling	Language	Concepts of Number	Math Computatn	Math Applicatns
Age: 14						
DECILE						
1	316-456	311-494		326-503	335-549	338-480
2	457-481	495-519		504-524	550-570	481-501
3	482-490	520-535		525-535	571-586	502-518
4	491-511	536-566		536-553	587-602	519-542
5	512-535	567-579		554-577	603-627	543-553
6	536-547	580-604		578-589	628-638	554-569
7	548-559	605-621		590-599	639-654	570-578
8	560-582	622-648		600-625	655-672	579-607
9	583-604	649-669		626-650	673-696	608-630
10	605-827	670-826		651-823	697-847	631-836
Age: 15						
DECILE						
1	316-465	311-503		326-494	335-564	338-495
2	466-496	504-525		495-542	565-581	496-510
3	497-525	526-572		543-554	582-614	511-528
4	526-541	573-598		555-570	615-632	529-545
5	542-554	599-611		571-585	633-641	546-566
6	555-565	612-623		586-594	642-661	567-575
7	566-580	624-646		595-615	662-671	576-581
8	581-597	647-669		616-632	672-682	582-593
9	598-618	670-697		633-658	683-715	594-624
10	619-827	698-826		659-823	716-847	625-836
Age: 16						
DECILE						
1	316-456	311-493		326-496	335-564	
2	457-476	494-526		497-530	565-614	
3	477-509	527-551		531-565	615-637	
4	510-527	552-595		566-575	638-650	
5	528-531	596-611		576-594	651-657	
6	532-556	612-629		595-619	658-666	
7	557-582	630-644		620-629	667-680	
8	583-595	645-664		630-646	681-693	
9	596-624	665-679		647-667	694-704	
10	625-827	680-826		668-823	705-847	

	Reading Comprhnsn	Spelling	Language	Concepts of Number	Math Computatn	Math Applicatns
Age: 17						
DECILE						
1	316-468	311-513		326-515	335-565	
2	469-489	514-540		516-549	566-617	
3	490-508	541-580		550-569	618-633	
4	509-525	581-601		570-587	634-645	
5	526-540	602-618		588-607	646-662	
6	541-562	619-633		608-624	663-675	
7	563-593	634-659		625-639	676-685	
8	594-612	660-675		640-652	686-699	
9	613-630	676-691		653-669	700-711	
10	631-827	692-826		670-823	712-847	
Age: 18						
DECILE						
1	316-465	311-499		326-512	335-555	338-510
2	466-478	500-534		513-533	556-596	511-528
3	479-501	535-575		534-552	597-631	529-542
4	502-521	576-594		553-567	632-645	543-552
5	522-545	595-622		568-585	646-659	553-559
6	546-558	623-636		586-611	660-670	560-577
7	559-575	637-652		612-630	671-679	578-599
8	576-589	653-675		631-645	680-688	600-634
9	590-619	676-694		646-673	689-708	635-662
10	620-827	695-826		674-823	709-847	663-836

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APPENDIX

List of Participating Programs, Stanford Norming Project, 1983

Arizona
Arizona School for the Deaf and Blind
Cortez High School (Glendale Union High School District)
Scottsdale Unified School District

Arkansas
Arkansas School for the Deaf*

California
Alhambra Aural Education Program
Covina Valley Unified School District
Carnegie Junior High (Los Angeles Unified School District)
La Mesa-Spring Valley School District
Lompoc Unified School District*
Office of Special Education, Long Beach
Marlton School for the Deaf (Los Angeles)
Newport-Mesa Unified School District
St. Joseph's School for the Deaf (Orinda)
Gerald Smith School (San Bernadino County Schools)
San Luis Coastal Unified Schools
Santa Ana Unified School District
Orange County Hearing-Impaired Program
John Adams Junior High School (Santa Monica Unified School District)
Armijo Annex (Fairfield-Solano County)*
Tulare County Schools

Colorado
Colorado School for the Deaf and Blind*
Jefferson County Public Schools
Pueblo School District # 60

Connecticut
American School for the Deaf
Bunnell High School, Hearing Impaired Program (Stratford)
Hartford Board of Education

Delaware
Margaret S. Sterck School for the Hearing Impaired

District of Columbia
Model Secondary School for the Deaf
D.C. Public Schools, Division of Special Education
Kendall Demonstration Elementary School*

Florida
Florida School for the Deaf
Exceptional Student Education (Tampa)
Leon County Program for Hearing Impaired
Valparaiso Elementary (Okaloosa County Schools)
Jefferson Davis Middle School (West Palm Beach)
Pasco County District School Board

Georgia
Atlanta Area School for the Deaf
Clarke County Program for Exceptional Children
Clayton County Schools, Morrow Annex
Griffin Middle School (Smyrna)
Royston Elementary School (Franklin & Hart County Hearing Impaired Program)
Griffin-Spalding County Schools

Illinois
A. G. Bell Elementary School (Chicago)
Jefferson Junior High School, Aurora (Northwestern Illinois Association)
Special Education Association of Adams County*
Whitney M. Young High School (Chicago)
Sparta-Lincoln Attendance Center (Ten County Regional Program for the Hearing Impaired)
Dupage-West Cook Regional Special Education Association
Mid-Central Regional Program for Hearing Impaired

Indiana
Horizon Learning Center (Elkhart Public Schools)
Gary Community Schools
Lebanon Hearing Impaired Program
Northwest Indiana Special Education Cooperative

Iowa
Arrowhead Area Education Agency #5
Area Education Agency #7

Kansas
Kansas School for the Deaf
Wyandotte Special Education Cooperative
Curtis Junior High School (Wichita Public Schools)*

Kentucky
Jefferson County Public Schools
Newport Board of Education

Louisiana
Ascension Parish Schools
Bossier Parish Schools
Caddo Parish Schools
Jonesville Elementary (Catahoula Parish Schools)
East Baton Rouge Parish Schools
Chinchuba Institute for the Deaf
Richland Parish Schools

Maine
Bridgton Junior High School (SAD #61)

Maryland
Montgomery County Public Schools

Massachusetts
Beverly School for the Deaf
Boston School for the Deaf
Clarke School for the Deaf
Concord Area Special Education Collaborative*
Bartlett School (Lowell)
E D C O Secondary Hearing Impaired Program (Newtonville)
Willie Ross School for the Deaf*
M.E. Small Elementary School (West Yarmouth)

Michigan
Battle Creek Public Schools
Bay Arenac Intermediate School District
Williams Elementary School (Jonesville)
Mecosta-Osceola Intermediate School District
Way Elementary School (Bloomfield Hills)*
Owosso Junior High School (Shiawassee Independent School District)
Traverse Bay Intermediate School District

Minnesota
Minneapolis Public Schools

Mississippi
Clarksdale Speech & Hearing Clinic**

Missouri
Missouri School for the Deaf
South Elementary (Jefferson City Public Schools)
Loughead Learning Center, J.M. Smith School (Poplar Bluff)
Malden R-1 School District

Montana
Montana State School for the Deaf and Blind

Nebraska
Nebraska School for the Deaf*

Nevada
John F. Miller Elementary School (Las Vegas)

New Hampshire
Regional Co-operative Program for Hearing Impaired (North Country Education Services-Berlin)
Manchester Program for the Hearing Impaired

New Jersey
Special Services School District of Bergen County
Bruce Street School for the Deaf (Newark)
Jersey City Board of Education
Thomas E. Bowe School (Glassboro)*
A. Harry Moore School (Jersey City)
Summerfield Elementary (Neptune)
Toms River School System

New Mexico
New Mexico School for the Deaf

New York
New York State School for the Deaf (Rome)
St. Mary's School for the Deaf (Buffalo)*
Albany, Schoharie, Schenectady BOCES
Monroe County BOCES
Broome County BOCES
Cleary School for the Deaf (Ronkonkoma)
St. Joseph School for the Deaf (Bronx)
Corcoran High School (Syracuse City School District)
Onondaga/Madison BOCES Deaf Program

North Carolina
North Carolina School for the Deaf (Morganton)
Roanoke Rapids City Schools

Ohio
St. Rita School for the Deaf (Cincinnati)
Belle Stone School (Canton City Public Schools)
Special Education Branch, Cincinnati Public Schools
Four County Program for Hearing Impaired (Wauseon)
Steubenville City Schools
Millridge Center for Hearing Impaired (Cleveland)
Dayton Public Schools
Toledo Public Schools

Oregon
Oregon State School for the Deaf

Pennsylvania
Scranton State School for the Deaf
Willis and Elizabeth Martin School (Philadelphia)
Intermediate Unit #1 (California)
Allegheny Intermediate Unit #3
Lancaster-Lebanon Intermediate Unit #13
Montgomery County Intermediate Unit #23

South Carolina
School District #5 (Anderson)
School District of Greenville County
Spartanburg County Hearing Handicapped Program

South Dakota
South Dakota School for the Deaf

Tennessee
Harrison Chilhowee Baptist Academy (Seymour)
Memphis Oral School for the Deaf

Texas
Arlington Regional Day School for the Deaf
San Antonio Regional Day School
Brownsville Regional Day School for the Deaf
Burleson Independent School District
Comal Independent School District
Hays-Blanco Special Education Cooperative
Houston Regional Day Program for the Deaf
Houston School for Deaf Children
Temple Regional Day School for the Deaf
East Harris County Cooperative
Seguin Independent School District
Waxahachie Regional Day School for the Deaf

Virginia
Alexandria City Public Schools
Hearing Impaired Program (Midlothian-Chesterfield County Public Schools)
Wise County Schools

Washington
Columbia Basin Children's Hearing Program
Highline Public Schools

West Virginia
Central Elementary School (Beckley-Raleigh County Schools)

Wisconsin
Wisconsin School for the Deaf

Wyoming
Wyoming School for the Deaf

* Programs who also participated in the study of parallel forms reliability, 1984.

** Although speech and hearing clinics were deleted from the sampling plan, Clarksdale had participated in the pilot testing of the screening test and was therefore invited to participate in the norming.